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ITT Industries
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Focused Feasibility Study Report

Former Bronson Reel Facility - OU1 Bronson, Michigan

Prepared for:
**ITT Industries, Inc.
Anaheim, California**

Submitted to:
**EPA Region V
Chicago, Illinois**

May 2006

May 11, 2006

VIA FEDERAL EXPRESS

Ms. Terese Van Donsel
Remedial Project Manager
United States Environmental Protection Agency
77 West Jackson Blvd., Mailcode SR-6J
Chicago, Illinois 60604-3590

RE: Final Focused Feasibility Study Report
North Bronson Former Facilities - Bronson, Michigan
Former Bronson Reel Facility- OU1

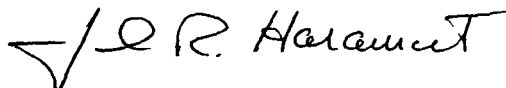
Dear Ms. Van Donsel:

In accordance with the Administrative Order by Consent issued by the Environmental Protection Agency (EPA) Region V on September 30, 2002 for the Former Bronson Reel Facility - OU1, enclosed are two (2) copies of the Final Focused Feasibility Study (FFS) Report. This report has been prepared in accordance with the Comprehensive Environmental Response, Compensation, and Recovery Act (CERCLA); the National Oil and Hazardous Substances Contingency Plan (NCP) of November 20, 1985 (50 Federal Register [FR] 47973); the Superfund Amendments and Reauthorization Act (SARA) of October 17, 1986; the amended NCP of March 5, 1990 (55 FR 8666); and requirements of the Michigan Department of Environmental Quality (MDEQ) Part 201 regulations. Comments received from both EPA and MDEQ in a letter dated March 15, 2006, have been incorporated into this Final FFS Report.

You may contact me at (864) 234-3569, Rhea Lowell at (651) 695-1875, or Teresa Olmsted of ITT at (714) 630-3175 if you have any questions or require additional information.

Sincerely,

Earth Tech, Inc.



John R. Haramut, P.G.
Earth Tech Project Manager

/enclosures

cc: Ms. Deborah Larsen, MDEQ
Mr. Charles Graff, MDEQ
Mr. Rick Swearingen, Weston Solutions, Inc.
Ms. Anastasia Hamel, Borg Warner, Inc.
Ms. Teresa Olmsted, ITT Industries, Inc.
Ms. Fern Daves, ITT Industries, Inc.



A **tyco** International Ltd. Company

Ms. Terese Van Donsel
May 11, 2006
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L:\work\52745\admin\Correspondence\Letters\FFS\051106 Final FFS Cover Letter (Rev01)

FOCUSED FEASIBILITY STUDY REPORT

Former Bronson Reel Facility – OU1 Bronson, Michigan

U.S. EPA SITE IDENTIFICATION NUMBER A4E7

Prepared for:

ITT Industries, Inc.
Anaheim, California

Prepared by:

Earth Tech, Inc.
Greenville, South Carolina

May 2006

FOCUSED FEASIBILITY STUDY REPORT

North Bronson Former Facilities Former Bronson Reel Facility – NBFF OU1 Bronson, Michigan

The undersigned certifies that he has reviewed the attached document and that the document is in material compliance with the requirements of the Administrative Order by Consent and Scope of Work dated September 30, 2002 for the North Bronson Former Facilities, Bronson Reel facility – Operable Unit 1 (NBFF OU1). To the best of his knowledge, this report is also in material compliance with applicable state and federal regulations. The information contained herein is consistent with Earth Tech standards and generally accepted practices in the environmental profession.

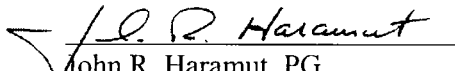

John R. Haramut, PG
South Carolina PG No. 1136
Earth Tech Project Manager
May 2006

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LIST OF ACRONYMS

amsl	above mean sea level
AOC	Administrative Order by Consent
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	below ground surface
CD	County Drain
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPC	Chemical of Potential Concern
COPEC	Chemical of Potential Ecological Concern
CSM	Conceptual Site Model
DRO	Diesel Range Organics
ET	Earth Tech
FDA	Fletcher Driscoll & Associates LLC
FFS	Focused Feasibility Study
FR	Federal Register
Higbie	Higbie Manufacturing
HQ	Hazard Quotient
ITT	ITT Industries, Inc.
LNAPL	Light Non-Aqueous Phase Liquid
MCL	Maximum Contaminant Level
MDEQ	Michigan Department of Environmental Quality
NBFF	North Bronson Former Facility
NBIA	North Bronson Industrial Area
NCP	National Oil and Hazardous Substances Contingency Plan
OU	Operable Unit
OVA	Organic Vapor Analyzer
PCE	Tetrachloroethene
PRG	Preliminary Remediation Goal
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SOW	Statement of Work
SRA	Streamlined Risk Assessment
SRI	Streamlined Remedial Investigation
TBC	To-Be-Considered
TCA	Trichloroethane
TCE	Trichloroethene
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
U.S. EPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

TCE concentrations in groundwater beneath the former Bronson Reel Facility originate at upgradient sources.

This report presents the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Focused Feasibility Study (FFS) for the former Bronson Reel facility located at 505 North Douglas Street in the City of Bronson, Michigan. The former Bronson Reel facility is designated Operable Unit (OU) 1 of the North Bronson Former Facilities (NBFF) site. The 1.85 acre former Bronson Reel property is located within the footprint of the larger North Bronson Industrial Area (NBIA) Superfund site encompassing an area of approximately 220 acres in the City of Bronson, Michigan. Although ITT Industries, Inc. (ITT) never controlled operations at the former Bronson Reel property and has only a remote connection to the property, ITT entered into an Administrative Order by Consent (AOC) with the U.S. Environmental Protection Agency (U.S. EPA) Region 5 to determine whether NBFF OU1 is a source of trichloroethene (TCE) or other compounds to regional groundwater. ITT performed a Streamlined Remedial Investigation (SRI) and Streamlined Risk Assessment (SRA) of NBFF OU1 and determined that the investigated soil areas are not a source of TCE to groundwater and that concentrations of other compounds that remain in these soils are within relevant cleanup criteria.

TCE was not detected in soil or sludge samples collected prior to soil removal actions.

Based on investigation results, extensive removal actions were conducted at the property in 1988, 1989, and 1990 in order to remove oil-stained soils and soils with metal concentrations above background levels. The removal actions included excavation of 10,440 tons of soil in the yard area west of the former main manufacturing facility. Seventy percent of the exposed soils within the facility's fence were excavated, down to the water table in most areas. These excavations also included removal of an underground oil storage tank formerly containing heating oil and subsequently cutting oil, an oil-water separator, and a portion of the NBIA industrial sewer along the northern edge of the property. Analytical results from sludge samples collected from portions of the industrial sewer and related catch basins excavated from the former Bronson Reel property indicate that no volatile organic compounds (VOCs) were associated with the sludge.

There is no unacceptable human health or ecological risk at the property.

During the SRI, 762 groundwater analyses and 56 soil analyses were performed on 184 samples collected. These SRI samples and numerous soil samples collected at the property in 1988 through 1990 were evaluated in the SRA. Results of the SRA conducted for NBFF OU1 indicate that remaining site-related contaminants pose no unacceptable risk to the environment or human health. The SRA evaluated soil and groundwater concentrations in relation to industrial screening values. An additional evaluation in this FFS report shows that no unacceptable risk is posed to human health when concentrations are compared to Residential Michigan Department of Environmental Quality (MDEQ) Generic Cleanup Criteria for soils. Although soil samples were not collected beneath the foundation of the main manufacturing building, groundwater sampling downgradient of the building indicates that these soils are not a detectable source of contamination to groundwater. From a direct contact perspective, however, the condition of these soils has not been directly characterized.

There are exceedances of drinking water criteria present below the Former Bronson Reel facility, but a review of site data has not tied these exceedances to residual contamination in site soils. Data concerning historical contamination at, and soils previously excavated from, the property are limited when compared to contemporary characterization standards. Fletcher Driscoll & Associates' evaluation of the data set does not indicate that the site soils were a source of TCE to regional groundwater. Groundwater contamination is believed to be primarily the result of upgradient sources and possible contaminant contributions from impacted industrial and stormwater sewers. The SRA and MDEQ Generic Cleanup Criteria comparisons show the property could be put into productive reuse, provided groundwater use is restricted. The Former Bronson Reel property is within the area of municipal water service. The area-wide groundwater contamination problem will be addressed through separate U.S. EPA source control and enforcement actions. U.S. EPA has not identified the need for any facility-specific actions to address contaminated groundwater below the Former Bronson Reel facility.

Thus, the remedial action objectives (RAOs) for the property are the following:

- Prevent future use of groundwater beneath the property; and
- Limit potential exposure to soils beneath the main building foundation.

General response actions appropriate for the property include no further action and development of institutional controls. Possible alternatives were developed from the general response actions to address future potential exposure to property soils and groundwater under a hypothetical, unrestricted land use scenario. The following remedial alternatives were developed:

- Alternative 1: No Further Action with Owner/Operator Due Care under MCLA324.20107a, and
- Alternative 2: No Further Action with Institutional Controls.

These alternatives were subjected to a detailed analysis based on nine National Oil and Hazardous Substances Contingency Plan (NCP) criteria. Based on this evaluation and the subsequent comparative analysis, both alternatives meet the NCP Threshold Criteria of Protection of Human Health and the Environment and are in compliance with Applicable or Relevant and Appropriate Requirements (ARARs). Alternative 1 includes implementation of Michigan's Part 201 due care provisions to prevent disturbance of or exposure to the potential presence of unacceptable levels of constituents in soils beneath the former manufacturing building. Alternative 1 also relies upon the implementation of the NBIA OU1 ROD-required groundwater ordinance to restrict groundwater use in the entire NBIA area. This interim protective measure prohibits the use of groundwater until cleanup standards can be met. Alternative 2 provides an additional degree of assurance by restricting use of groundwater beneath the site and disturbance of the building foundation without soil characterization (similar to Michigan's Part 201 due care provisions) with the implementation of a Restrictive Covenant

attached to the property deed. Alternative 2 is recommended because it provides greater protection against potential future exposure.

1.0 INTRODUCTION

NBFF OU1 is located within the footprint of the NBIA where groundwater contamination exists and has been attributed to upgradient sources within the NBIA, not NBFF OU1.

This Focused Feasibility Study (FFS) has been developed for the former Bronson Reel facility located at 505 North Douglas Street in the City of Bronson, which is in south-central Michigan (Figure 1-1). The 1.85 acre former Bronson Reel facility is designated Operable Unit (OU) 1 of the North Bronson Former Facilities (NBFF) site. The property is located within the footprint of the larger North Bronson Industrial Area (NBIA) federal Superfund site encompassing an area of approximately 220 acres in the City of Bronson, Michigan (Figure 1-1). ITT entered into an Administrative Order by Consent (AOC) with the U.S. Environmental Protection Agency (U.S. EPA) Region 5 to determine whether NBFF OU1 was a source of trichloroethene (TCE) detected in groundwater. ITT performed a Streamlined Remedial Investigation (SRI) and Streamlined Risk Assessment (SRA) of NBFF OU1 and determined that the property is not a source of TCE to groundwater and that site-related compounds in soils do not pose a risk to human health or the environment. There are exceedances of drinking water criteria present below the Former Bronson Reel facility, but a review of site data has not tied these exceedances to residual contamination in site soils. Data concerning historical contamination at, and soils previously excavated from, the property are limited when compared to contemporary characterization standards. Fletcher Driscoll & Associates' (FDA) evaluation of the data set does not indicate that the site soils were a source of TCE to regional groundwater. Groundwater contamination is believed to be primarily the result of upgradient sources and possible contaminate contributions from impacted industrial and stormwater sewers. The SRA and MDEQ Generic Cleanup Criteria comparisons show the property could be put into productive reuse, provided groundwater use is restricted. The Former Bronson Reel property is within the area of municipal water service. The area-wide groundwater contamination problem will be addressed through separate U.S. EPA source control and enforcement actions. U.S. EPA has not identified the need for any facility-specific actions to address contaminated groundwater below the Former Bronson Reel facility.

The purpose of this FFS is to develop remedial action objectives (RAOs) for the SRI/SRA identified risks associated with the property. Following development of RAOs, remedial alternatives were developed, evaluated, and compared.

This report has been prepared in accordance with the Comprehensive Environmental Response, Compensation, and Recovery Act (CERCLA); the National Oil and Hazardous Substances Contingency Plan (NCP) of November 20, 1985 (50 Federal Register [FR] 47973); the Superfund Amendments and Reauthorization Act (SARA) of October 17, 1986; the amended NCP of March 5, 1990 (55 FR 8666); and requirements of the Michigan Department of Environmental Quality (MDEQ) Part 201 regulations. The general framework of this report is based on the U.S. EPA document Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (U.S. EPA, 1988).

1.1 NBIA Description

The NBIA is a federal Superfund site located in the City of Bronson, Michigan that encompasses an approximate 220-acre area (Figure 1-1). It is bounded on the north by an engineered drainage canal known as county drain (CD) 30, on the east by Lincoln Street as projected northward to CD30, on the south by Fillmore and Union Streets, and on the west by Burr Oak Road as projected northward to CD30.

In the early 1900s, metal-plating operations at various facilities in the North Bronson area discharged wastewater directly to CD30. Cattle and fish kills in the 1930s were linked to ingestion of cyanide-contaminated water from this drain. In response to concerns about water quality in CD30, the City of Bronson built and operated the western lagoons in 1939. Bronson Reel, Scott Fetzer, and LA Darling discharged plating wastes to the western lagoons through an industrial sewer. Responding to overuse of the western lagoons, the city constructed new lagoons in 1949 on the east side of the NBIA. Three companies – LA Darling, Bronson Plating, and Scott Fetzer – discharged wastewater to the eastern lagoons via the eastern industrial sewer. Bronson Reel did not discharge to the eastern lagoons.

Along with LA Darling, Bronson Plating, Scott Fetzer, and the City of Bronson, ITT was listed as a potentially responsible party (PRP) for the NBIA Superfund Site OU1. OU1 is generally made up of the western and eastern lagoons, CD30, and groundwater use restrictions by ordinance throughout the 220-acre NBIA. On June 23, 1998, U.S. EPA issued a Special Notice letter to ITT for NBIA OU1. ITT was named a PRP because of its 1972 acquisition of a former Bronson Reel facility owner, Higbie Manufacturing (Higbie). Higbie had sold the Bronson Reel Company and the facility 9 years prior to ITT's acquisition; thus ITT has only a remote connection with this former facility. Although ITT denies any CERCLA liability as a corporate successor or otherwise, ITT is a cooperating party and has responded to U.S. EPA Special Notice letters. In March 1999, the NBIA PRP Group signed a Consent Decree to implement the Record of Decision (ROD) for NBIA OU1. ITT was a signatory to that Consent Decree, which was filed on February 29, 2000. Since that time ITT and other members of the NBIA OU1 PRP Group have been working toward completion of the requirements of the Consent Decree.

1.2 North Bronson Former Facilities

On September 29, 2000, the U.S. EPA issued a Special Notice Letter to PRPs, including ITT, to begin negotiations with the U.S. EPA to conduct a Baseline Risk Assessment and Feasibility Study for the inactive industrial sewer system (NBIA OU2). Negotiations for this work were problematic because of a lack of information concerning potential source areas at individual facilities located upgradient of the inactive industrial sewer. U.S. EPA and the PRPs agreed to terminate negotiations regarding the NBIA OU2 and proceed with investigations of the individual facilities in the NBFF. The former Bronson Reel facility is designated NBFF OU1; the other facilities include the former LA Darling facility

(NBFF OU2) and the former Scott Fetzer facility (NBFF OU3). The locations of these former facilities are shown on Figure 1-2. The NBFF OU1 buildings and property boundary are shown on Figure 1-3.

1.3 Administrative Order by Consent Requirements

In July 2001, ITT received a Special Notice letter from the U.S. EPA for the former Bronson Reel facility. The AOC and Statement of Work (SOW) requiring ITT to complete a SRI/SRA and FFS were signed by U.S. EPA Region 5 on September 30, 2002 (U.S. EPA, 2002a).

The objectives stated in the AOC are:

1. *To determine the nature and extent of TCE contamination in groundwater caused by the release or threatened release, if any, of TCE from [NBFF] OU1 (excluding the industrial sewer) by conducting a remedial investigation;*
2. *To determine and evaluate alternatives for remedial action (if any) to prevent, mitigate or otherwise respond to or remedy identified risks from [NBFF] OU1-related contamination other than that determined to be caused by the industrial sewer or other off-Site sources; and*
3. *To provide for the recovery of response and oversight costs incurred by the EPA with respect to the Consent Order.*

Completion of the SRI/SRA Report meets the requirements of the AOC and SOW.

"Based on the evidence provided, the MDEQ feels that it is reasonable to conclude that the former Bronson Reel facility is not currently contributing to groundwater contamination." (MDEQ, 2005a)

The SRI/SRA Report (FDA in association with Earth Tech [ET], 2005) was prepared on behalf of ITT and submitted to the U.S. EPA pursuant to the AOC and SOW for the NBFF OU1 (U.S. EPA, 2002a). The SRI/SRA, approved by U.S. EPA on August 29, 2005, demonstrated that:

- Remedial activities conducted from 1988 to 1990 effectively removed accessible property soils affected by cutting oils and metals¹.
- No unacceptable risk is posed to human health. No final chemicals of potential concern (COPCs) were identified either for surface or subsurface soil or for the shallow or deep groundwater. No final chemicals of potential ecological concern (COPECs) were identified.
- Concentrations of TCE and its degradation byproducts in groundwater beneath the property appear to primarily originate from upgradient sources (Figure 1-4). Data concerning historical contamination at, and soils previously excavated from the property are limited when compared to contemporary characterization standards. FDAs' evaluation of the data set does not indicate that the site soils were a source of TCE to regional

¹ Light non-aqueous phase liquid (LNAPL) is still present at MW2.

groundwater. The SRI determined that no source for TCE in groundwater currently exists at OU1.

- Use of groundwater as a potable source is not anticipated at NBFF OU1 because the City of Bronson plans to enact an ordinance restricting the use of groundwater within NBIA OU1². This ordinance is required by the NBIA OU1 ROD. The proposed area where the groundwater use restriction ordinance will be enforced is shown on Figure 1-5. The ROD identifies MCLs and Michigan Groundwater Surface Water Interface Criteria as cleanup goals for NBIA groundwater. Use restrictions are a protective measure to be put in place until cleanup goals can be met.

The SRI/SRA satisfactorily met the requirements set forth in the AOC and SOW. As such, the AOC mandates the evaluation of remedial alternatives to address identified risks associated with NBFF OU1. Since no risks to human health or the environment were identified, U.S. EPA guidance indicates that a no further action remedy is appropriate (U.S. EPA, 1991). This FFS develops and evaluates remedial alternatives that require the owner/operator to minimize the potential for exposure to soils beneath the main building and prevents future use of groundwater beneath the property.

1.4 Report Organization

Section 2.0 of the FFS provides a summary of the site background, previous removal actions, results of the SRI/SRA, and an additional screening of MDEQ Generic Cleanup Criteria for residential use to evaluate whether unacceptable risks to human health are present in an unrestricted property use scenario. In Section 3.0, RAOs for the property are discussed, and in Section 4.0 remedial alternatives are developed and evaluated in relation to the nine CERCLA criteria. In Section 5.0, a Comparative Analysis of Alternatives is performed. Section 6.0 provides a list of references used to prepare this report.

² City of Bronson, (2004), Letter from Mr. David O'Rourke to Mr. Stephen Cunningham and Ms. Deborah Larsen, Michigan Department of Environmental Quality, October 29, 2004.

2.0 BACKGROUND INFORMATION

2.1 Property and Surrounding Area Description

The former Bronson Reel facility is located at 505 North Douglas Street in the City of Bronson, which is in south-central Michigan. The property is located on a glacial outwash plain with little topographic relief at an elevation approximately 910 to 920 feet above mean sea level (amsl). An area of slightly higher elevation caused by the presence of low ridges composed of glacial till is located northwest of the city; a marshland lies just to the northeast (Figure 1-1). The marshland drains to Swan Creek, which flows north of Bronson and eventually turns to the southwest. An engineered drainage canal known as CD30 flows along the northern boundary of the City of Bronson and the NBIA and eventually discharges to Swan Creek.

The former Bronson Reel was a fishing reel-manufacturing facility that occupies 1.85 acres and includes a 43,500 square-foot former manufacturing building and one 2,600 square-foot outlying building formerly used for storage (Figure 1-3). The facility is bounded on the north by a railroad that is currently owned by the Branch and St. Joseph Counties Rail Users Association. An industrial area exists north of the now inactive railroad. The area northwest of the former facility is of mixed-use which is generally agricultural. Properties immediately east of the former facility are vacant or residential; the former LA Darling and Scott Fetzer sites lie farther east along West Railroad Street. Residential properties exist south and southeast of the former facility. Bronson Precision Products/Royal Oak Industries has an active manufacturing business immediately west of the property (Figure 1-2). Previously, a Standard Oil facility was located approximately 200 feet northeast of the former Bronson Reel Facility from at least 1927 through 1955.

2.2 Regional Geology and Hydrogeology

Glacial deposits attributable to Pleistocene glaciation cover the Bronson area. The surficial deposits consist mostly of sands and underlying clays resulting from the northeast to southwest advance of the Saginaw Lobe during late Wisconsin time (Leverett and Taylor, 1915; Monaghan and Larson, 1986). Three distinct glacial deposits occur in the NBIA: an upper sand and gravel unit, a silt/clay aquitard, and a lower sand and gravel unit (Warzyn, 1993). These glacial deposits represent a sequence of 1) proglacial outwash (lower sand and gravel unit) deposited on the pre-existing land surface as the most recent glacier advanced from the northeast, 2) a lodgement till (silt/clay layer) deposited as the glacier over-rode the area, and 3) recessional outwash (upper sand and gravel unit) as the glacier retreated to the northeast.

The NBIA is located in the St. Joseph Watershed. Man-made CD30 forms the northern boundary of the NBIA and flows to the west discharging to Swan Creek (Figure 1-1). Known discharges currently received by CD30 include Bronson Plating, the Bronson Wastewater Treatment Plant, the storm sewer, and various

farm fields located north of the drain. Early investigations of the NBIA indicated that shallow groundwater flows to the northwest and discharges to CD30. More recent investigations indicate that, occasionally, the groundwater system may be recharged by surface water from CD30 and during some periods of time groundwater flow is to the west-southwest.

The depth to groundwater in the NBIA is approximately 10 feet below ground surface. The water table surface reflects the area topography and is only slightly inclined. Hydraulic gradients measured in the southern portion of the NBIA range from 0.0002 to 0.0003 feet per foot; hydraulic gradients are steeper near CD30, and an upward vertical gradient also exists in the vicinity of the drain. The groundwater flow velocity is estimated at approximately 50 feet per year (FDA and ET, July 2005).

2.3 Property Ownership and Operational History

The former facility property was developed by the Bronson Reel Company in 1929 for the manufacture of fishing reels. Bronson Reel Company began as a family-owned company. By 1947, Bronson Reel Company was a wholly owned subsidiary of McAleer Manufacturing Company, which changed its name to Higbie Manufacturing Company in 1950. Operations included metal plating and machining of small parts used to make fishing reels and other precision components. Beginning in the middle 1950s, Bronson Reel began to anodize its reels, thereby reducing the extent of its plating processes. In 1963, Higbie sold its Bronson Reel Division, including the property, to (Old) Bronson Specialties, Inc. Following the sale, the production of fishing reels declined, finally terminating in 1968. After 1968, (Old) Bronson Specialties, Inc. continued to produce machine screws and other metal parts. Plating operations were discontinued in 1969, and the plating lines were sold in mid-1970. Machining of small metal parts was continued by (Old) Bronson Specialties, Inc. until 1979³, by Kuhlman Corporation/(New) Bronson Specialties, Inc. (Kuhlman/New BSI) from 1979 through 1984, and, finally, by Bronson Precision Products, Inc. from 1984 until at least the early 1990s⁴. The overall ownership history of the property is depicted in Figure 2-1.

There are no operational or environmental data indicating that TCE was used at the Bronson Reel property.

Bronson Reel Company's manufacturing processes included two nickel plating lines, one chromium plating line, and two cadmium barrel plating lines. Cyanide was used in the cadmium plating lines; however, the cadmium barrel lines were reportedly only used on a seasonal basis (approximately 10 percent of the time). The use of anodizing processes, beginning in the 1950s, reduced the use of cyanide. There are no operational or environmental data indicating that volatile organic compounds (VOCs) were used as part of the regular manufacturing process at the Bronson Reel Company. In other words, ITT has no knowledge or

³ In 1979 (Old) Bronson Specialties, Inc. and the property was sold to Kuhlman Corporation/ (New) Bronson Specialties, Inc.

⁴ In January 1985, the property was leased to Bronson Precision Products, but (New) Bronson Specialties, Inc. continued to own the property through to the present. In 1999, (New) Bronson Specialties, Inc. became a wholly owned subsidiary of Borg Warner Corporation following Borg Warner's merger with Kuhlman Corporation.

evidence of degreasers, degreasing pits or tanks, or use of significant quantities of TCE or other solvents for any purpose at the former Bronson Reel property.

After 1968, Bronson Specialties, Inc. and subsequent operating entities continued the production of machine screws and other metal parts. Metal shavings and cuttings were reportedly stored outside in uncovered bins located in the southwestern corner of the main yard area. After 1985, Bronson Precision Products operations reportedly consisted of a screw machine, casting machines, and a metal turning shop. Chemical compounds used at the property included cutting oils, lubricating oils, naphtha, water soluble oils, and synthetic oils. Small quantities, less than 5 gallons per month, of 1,1,1-trichloroethane (1,1,1-TCA) were reportedly used by Bronson Precision Products (former employee interview, Chuck Hawkins and Cecil Davis, Bronson Precision Products, included in Appendix A of the NBIA Remedial Investigation [RI], [Warzyn, 1993]).

Currently, the property is zoned industrial, no manufacturing operations are conducted, and the facility is vacant. The property owner, BorgWarner Corporation/ (New) Bronson Specialties Inc., has indicated that the facility may be leased and used to store construction equipment. The property is fenced and secured to prevent potential trespassing.

2.4 Summary of Previous Remedial Actions

More than 10,000 tons of soil have been excavated and removed from the property to remove cutting oil-stained soils and metals above background levels.

An underground heating/cutting oil storage tank, oil-water separator, and a portion of the former western industrial sewer were also removed from the property.

On June 14, 1988, the Michigan Health Department⁵ inspected the property, which at that time was operated by Bronson Precision Products under lease from Kuhlman/New BSI. Based on the results of that property inspection, the Health Department issued a list of required corrective actions that included proper containment of waste storage drums and metal shavings and removal of soils impacted with cutting oils (Michigan Department of Public Health, 1988). Thereafter, the property owner at the time, Kuhlman/New BSI, conducted an investigation and subsequent removal action from 1988 through 1990. Excavation of soils proceeded in several phases and resulted in the removal and appropriate off-site disposal of 10,440 tons of soil. In fact, 70 percent of the exposed soils within the facility's fence have been removed, down to the water table in most areas. The soils were disposed at a regulated landfill facility. These excavations also included removal of an underground storage tank (UST; used to store heating oil and subsequently cutting oil), an oil-water separator, and a portion of the former NBIA industrial sewer along the northern edge of the property. The removal actions are summarized in the Site Status Report, Former Bronson Reel Facility, prepared by FDA dated March 2001 and in Section 1.4 of the SRI/SRA Report (FDA and ET, July 2005), and they are depicted in Figure 2-2.

The removal actions focused on soils that contained metals above background levels or that exhibited oil staining or elevated organic vapor analyzer (OVA)

⁵ Personnel from a local office (Branch, Hillsdale, St. Joseph District Health Department) performed the inspection and wrote the follow-up correspondence.

TCE is not associated with the heating/cutting oils found beneath the property.

readings. Soil borings completed before the soil removal indicated that metals concentrations decreased rapidly with depth. Metal concentrations in soils that exceeded background levels were effectively removed in the excavated areas. The excavations indicated that soils affected by cutting oils continued down to the water table in three areas: in the northeast portion of the yard, including beneath the 8,000-gallon heating/cutting oil UST removed during the excavation; beneath the oil-water separator (also removed during the excavation); and in the southwest yard area. An oil sheen was observed on the groundwater at the base of the excavation in the southwestern portion of the yard. Prior to backfilling the excavated yard area, a groundwater/free product collection system was installed to collect any residual oils that might collect on the water table. During implementation of the SRI/SRA in 2003 and 2004, no free product was observed in this structure. Up to 3.7 inches of petroleum free product was observed in 2003 and 2004 at MW2, which is located in the southwest corner of the yard area near the former location of the shavings/cutting bins. Analysis of the product and groundwater beneath the product during the SRI/SRA by both ITT and MDEQ showed that TCE is not present in either the oil ($<450 \mu\text{g/kg}$) or the groundwater immediately beneath the free product ($<1 \mu\text{g/L}$). The only VOC detected in the LNAPL was ethylbenzene at an estimated amount of $110 \mu\text{g/kg}$; no VOCs were present in the groundwater sample collected immediately below the LNAPL by MDEQ. Ethylbenzene is a component of gasoline and could be present in the sample because of gasoline use at or near the property or as a minor component or contaminant of the heating or cutting oils.

Geoprobe[®] samples collected by the MDEQ in 1998 and analyzed by MDEQ's mobile laboratory indicated that deeper groundwater was affected by TCE directly north of the facility (MDEQ, May 1999). The highest TCE concentration ($3,900 \mu\text{g/L}$) was detected by MDEQ at 22 to 26 feet bgs in GPW4⁶. This sampling point is located directly north of the facility and approximately 20 feet downgradient of the City's industrial sewer as shown in Figure 2-2. The concentrations of TCE measured 150 feet to the east and west of GPW4 during the same sampling event were $18 \mu\text{g/L}$ at GPW6 and $34 \mu\text{g/L}$ at GPW5, indicating that the concentrations detected at GPW4 declined rapidly to the east and west. Thus, based on GPW4, the agencies believed that additional investigation was needed to determine if the property might be a source of this TCE.

2.5 Summary of the SRI Results and the Nature and Extent of Constituents

762 groundwater analyses & 56 soil analyses were performed on 184 samples over the course of the SRI/SRA.

As stated above, one of the purposes of the SRI was to determine whether the former facility is a source for TCE in groundwater. Soil and groundwater samples also were tested for the presence of total petroleum hydrocarbons - diesel range organics (TPH-DRO), metals, and cyanide. The resulting dataset provides sufficient data to evaluate the nature and extent of these constituents. Figure 2-3 depicts the locations of soil and groundwater sampling conducted

⁶ This concentration could not be duplicated during the SRI. The concentration of TCE in a groundwater sample collected at this same location and depth in 2004 was $45 \mu\text{g/L}$.

during the SRI performed by ITT in 2003 and 2004. The table below shows the number of samples that were collected.

Summary of SRI Sampling and Analyses

Sample Matrix	Phase I SRI	Phase II SRI	Phase III SRI	Total Number of Samples
Soil	8 ¹	21 ²	6 ³	35
Groundwater	105 ⁴	44 ⁵	-	149

Notes:

¹ Samples collected at up to four depths and analyzed for VOCs.

² Samples collected at up to three depths and analyzed for VOCs and metals.

³ Samples collected at two depths and analyzed for chromium, hexavalent chromium, iron, pH, phosphorus, sulfate, sulfide, and total organic carbon (TOC).

⁴ Samples collected at up to seven depths and analyzed for VOCs, 1,2-dibromo-3-chloropropane/ethylene dibromide, TPH-DRO, metals, hexavalent chromium, and cyanide.

⁵ Samples collected up to seven depths and analyzed for VOCs, TPH-DRO, and metals.

A summary of the nature and extent of the constituents present at the facility is presented below. A detailed evaluation of the nature and extent is provided in the SRI/SRA Report (FDA and ET, July 2005). The findings of the SRI conclude that facility-related compounds, with the possible exception of TPH, exist at such low concentrations that no groundwater plume originates at the facility.

2.5.1 VOCs

The only VOCs detected in groundwater beneath the facility at concentrations above drinking water standards originate from an upgradient source or sources.

Chlorinated solvents, primarily TCE and its breakdown products, are present in groundwater beneath the property above drinking water standards; however, the groundwater impact stems from an upgradient source or sources located east of the property. 1,1,1-TCA and its breakdown products are also present in groundwater beneath the property at concentrations that do not exceed drinking water limits. These constituents, similar to TCE, originate at upgradient sources. Tetrachloroethene (PCE), which may have originated at the facility, is present at some locations in shallow groundwater beneath the property at low concentrations from 0.4J µg/L to 2.2 µg/L, which are below the drinking water limit. PCE was not detected downgradient of the property.

2.5.2 Metals

Although some metals are present in remaining soils at concentrations above those found in background samples, the extent of these soils is limited. All of the accessible soils within the fenced yard area have been removed. All that remains, therefore, is a narrow strip near the fence line and building where the excavation terminated. Concentrations of metals in groundwater downgradient of the facility are below federal maximum contaminant levels (MCLs) allowed for drinking water. Thus, the small amount of remaining residual metals in soils does not adversely affect groundwater quality downgradient of the property.

2.5.3 TPH

Petroleum hydrocarbons are present as light non-aqueous phase liquid (LNAPL) at MW2 and are also present in soils and shallow groundwater at and near the facility. It is likely that these hydrocarbons result from historic property operations. Because the potential source(s) of these hydrocarbons have been removed (UST, oil/water separator, and soils), it is expected that TPH concentrations will decline over time as a result of natural attenuation processes.

The LNAPL at MW2 has been analyzed for VOCs and PCBs. The only VOC present was ethylbenzene at an estimated amount of 110 µg/kg; no PCBs were present. In addition, VOCs were not detected at concentrations greater than 1.0 µg/L in the groundwater sample collected immediately below the LNAPL by MDEQ. Analysis results indicate that there are no contaminants associated with the LNAPL and that, as such, the TPH is not a CERCLA hazardous substance. It is expected that any concerns regarding the residual TPH at the facility would be addressed separately with the property owner, outside of the Superfund process. Evidence indicates that owners and operators of the Site after 1963 are responsible for TPH releases and that the current owner of the Site is a responsible party under Michigan's Part 201, M.C.L. 324.20101 *et seq.*, with respect to TPH. Thus the presence of LNAPL and TPH at the facility will not be addressed in this FFS.

2.6 Summary of Fate and Transport Mechanisms

Because the extent of residual constituents is limited, concentrations will eventually approach background levels.

Certain metals, petroleum hydrocarbons, and PCE have a suspected relationship to historic operations formerly conducted at the property. A qualitative evaluation of the fate and transport processes indicates that the nature and concentration of residual constituents prevent them from moving hydraulically downgradient at high concentrations or for significant distances. In fact, PCE occurs at low concentrations below MCLs in groundwater beneath the property and was not detected in groundwater downgradient of the property. Effective past source removals ensure an ongoing decline in petroleum hydrocarbons through attenuation. The previous remedial action also effectively removed soils containing metals. Movement of the residual metals will be limited because sorption of these compounds to soil particles and aquifer materials is the dominant transport mechanism (McLean and Bledsoe, 1992). Metals concentrations in groundwater downgradient of the facility are below MCLs.

As stated in Section 2.5.1, chlorinated solvents (TCE, 1,1,1-TCA and their breakdown products) are present in groundwater beneath the property. Concentrations of some of these constituents are above drinking water standards. The source(s) of these compounds are located upgradient (east) of the former OU1 facility. At Scott Fetzer, the highest reported concentration of TCE was 30,000 µg/L (at MW20 on 12/11/1991), and at LA Darling, the highest reported concentration of TCE was 43,000 µg/L (at GP9 on 10/4/1999). Because no significant remedial actions have occurred at either site, releases to groundwater have been occurring for decades and contaminant plumes have developed downgradient of these source areas. As a result of the low hydraulic gradient in

the NBIA (which promotes dispersion) and variations in groundwater flow direction over time, the regional groundwater plume is a broad plume that trends to the west-northwest from the source areas. It is likely that the regional NBIA plume will persist until its sources are remediated, although attenuation processes are occurring that will reduce VOC concentrations in groundwater downgradient of these sources.

2.7 Evaluation of Potential Risks to Human Health and the Environment

Potential risks that may be associated with the groundwater and remaining soil beneath the former Bronson Reel property were evaluated in the SRA. Conservative screening values were used to evaluate potential exposure from multiple compounds through several pathways. The SRA indicates that no unacceptable risk to human health or the environment results from potential exposure at the property. The analysis, however, did not determine whether the former facility could be used for unrestricted use in the future because only industrial use of the property was considered based on the current and most-likely future land use. To determine whether the unrestricted use of the property would result in possible unacceptable risks, an additional risk screening was performed (Section 2.7.2). In this screening, the soil and groundwater concentrations are compared to *residential* MDEQ Generic Cleanup Criteria and Screening Levels (MDEQ, 2005b) to provide an evaluation in relation to unrestricted land use. Ultimately, a determination of whether the property can be used for unrestricted use will aid in the evaluation of remedial alternatives.

2.7.1 Results of the Streamlined Risk Assessment

The SRA conducted for the former Bronson Reel facility evaluated potential risks posed by suspected property-related compounds to human and ecological receptors. In addition to soil and groundwater samples collected during the SRI, historic soil results were also incorporated into the SRA because the large number of samples collected from excavation sidewalls and borings installed outside the excavated area greatly increased the total number of soil samples. When performing the screening-level SRA, the comparison values used to screen the concentrations were conservative to account for potential exposure to multiple compounds through several pathways. The following assumptions were made to evaluate the appropriate exposure pathways and compounds in the SRA:

The SRA demonstrates the property poses no unacceptable risk to the industrial worker.

- Potential exposure for the *industrial* worker was considered because of current zoning and most-likely future land use;
- Concentrations of VOCs in groundwater originating from upgradient sources were not evaluated based on the requirements of the AOC/SOW;
- Historic on-site soil samples were not used unless the location and depth of the sample were known; and

- While the ingestion of groundwater is a possible pathway of exposure, groundwater ingestion was not included in the SRA because area-wide groundwater will be addressed via a separate U.S. EPA enforcement action(s) and because U.S. EPA did not identify the need for any groundwater source-control action at the Former Bronson Reel facility. Certainly, long-term exposure to groundwater above drinking water standards would result in unacceptable risk. The implementation of a municipal ordinance to control groundwater use is a protective measure required by the NBIA ROD to limit groundwater use until cleanup standards can be met.

Three constituents were identified as preliminary COPCs in the SRA because concentrations exceeded the screening levels for industrial exposure: carbon tetrachloride (one soil sample), total chromium (11 soil samples), and copper (one soil sample). The screening levels were based on U.S. EPA Region 9 preliminary remediation goals (PRGs; U.S. EPA, 2002b), but were conservatively reduced by a factor of 10 to account for potential additive effects of exposure. All of these compounds are below the published PRG value that is based on a risk factor of 10^{-6} (cancer risk of one in one million) or a hazard quotient (HQ) of one. As a result of this and other weight-of evidence evaluations, these three preliminary COPCs were not retained as final COPCs. Two other constituents, tin and TPH, were identified as preliminary COPCs in the SRA only because screening levels do not exist for these compounds and concentrations were above background concentrations, or because background concentrations were not available. Tin was present in two groundwater samples at 0.998J and 1.76J $\mu\text{g/L}$; TPH was present in many soil and groundwater samples. Evaluation of other potential screening values for tin and surrogate compounds for TPH demonstrated that these constituents should not be retained as final COPCs. Thus, no final COPCs were identified in the SRA.

A number of compounds were identified as preliminary COPECs because their concentrations in surficial soil exceeded the conservative ecological screening values. Based on a weight-of-evidence evaluation for these constituents (using average concentrations and other lines of evidence), these compounds were not retained as final COPECs. Additional factors demonstrate the facility does not provide favorable habitat: the property is industrial, only a small area of habitat is available (most of the property is covered by buildings and asphalt), the property is fenced, only limited areas of ruderal vegetation are present, no water bodies are near the facility, and the habitat is poor in both quality and diversity for forage and shelter.

The results of the screening-level risk analysis and the subsequent weight-of-evidence analyses demonstrate that no unacceptable risk to an industrial worker or the environment exists at the former OU1 facility (provided groundwater is not ingested). In order to determine if the property can be used for unrestricted use, an additional screening is provided below.

2.7.2 Screening Comparison to Residential MDEQ Generic Cleanup Criteria and Screening Levels

Concentrations of chemical compounds in soil and groundwater were compared to Residential MDEQ Generic Cleanup Criteria and Screening Levels (MDEQ, 2005b). All groundwater and soil data collected during the SRI were compared to these screening values regardless of their location in relation to the facility (i.e., data collected east [upgradient] and northwest of the property were used). All historic on-site soil data collected above the water table from excavation sidewalls or borings outside the excavated areas were included regardless of whether their location or sample depth was known. All compounds detected in soil and groundwater were included in the analysis regardless of whether they originated at the property or from upgradient sources. All potential exposure pathways were considered with the exception of groundwater ingestion and soil leaching to groundwater ingestion. The use of groundwater for drinking water was not evaluated because area-wide groundwater contamination will be addressed via a separate U.S. EPA action and the enactment of NBIA OU1 ROD-required city ordinance will restrict the installation of wells and the use of groundwater in the NBIA until cleanup criteria are met. The result of the screening evaluation for soils is presented in Table 2-1; the result for groundwater is presented in Table 2-2.

Tables 2-1 and 2-2 show that concentrations of constituents in soil and groundwater do not exceed the MDEQ Residential Generic Cleanup Criteria. This analysis indicates that there would be no unacceptable risk to human health for unrestricted property use with the following two qualifications:

- The groundwater ingestion was not evaluated; and
- Soils beneath the main building slab have not been directly characterized and should be tested by the owner/operator prior to removing the foundation.

2.8 Conceptual Site Model

The conceptual site model (CSM) for NBFF OU1 has been developed to simplify the breadth of information gathered during the SRI into an ordered set of components that can be used to evaluate the remedial alternatives and select the final remedy.

Vadose zone soils are primarily sand and gravel with varying amounts of interstitial silt and clay. The upper portion of the vadose zone typically contains slightly more silt or clay in the sand and gravel matrix than the saturated portion of the upper sand and gravel unit. A silty, clay till (aquitard) exists at depths ranging from 47.1 to 56.7 feet below ground surface (bgs).

Groundwater in the surficial sand and gravel aquifer occurs at approximately 10 feet bgs under unconfined (water-table) conditions. The groundwater flow direction is toward the west-northwest when groundwater levels are higher and shifts toward the west and southwest when water levels fall. The water table surface reflects the property topography and is only slightly inclined. The hydraulic gradient beneath the property is very flat and ranges from 0.0002 feet per foot to 0.0003 feet per foot. The groundwater flow velocity ranges from approximately 46 feet per year to 60 feet per year.

TCE and its breakdown products occur in groundwater beneath the property at concentrations above MCLs. 1,1,1-TCA and its daughter products also exist in groundwater beneath the property, although at concentrations below their respective MCLs. These compounds originate at known sources upgradient (east) of the facility.

The existence of certain metals, petroleum hydrocarbons, and PCE in soils and groundwater are potentially a result of former historic operations at the property. Their extent in soil is limited, however, because most of the soils were removed in 1988 to 1990. Furthermore, with the possible exception of TPH, these compounds exist at such low concentrations that no groundwater plume originates at the facility; concentrations in groundwater downgradient of the property are below MCLs. An evaluation of the fate and transport processes indicates that the low concentration of the residual constituents and their physical characteristics prevent them from moving hydraulically downgradient at high concentrations or for significant distances.

There is no unacceptable human health or ecological risk at the property.

The SRA demonstrates that there is no unacceptable potential risk to the industrial worker from constituents remaining in soils and groundwater as long as groundwater is not used for drinking water. Furthermore, no unacceptable potential ecological risk was identified as a result of constituents remaining in surficial soils at the property. Additional risk screening comparing soil and groundwater concentrations to MDEQ Residential Generic Cleanup Criteria shows that unrestricted use of the property would not pose an unacceptable risk to human health once the groundwater ordinance required by the NBIA OU1 ROD is enacted and enforced.

3.0 REMEDIAL ACTION OBJECTIVES

RAOs address chemical constituents specific to the property, media of concern, potential exposure pathways, and remediation goals. The objectives are based on the nature and extent of chemical compounds, threatened resources, and the potential for human and environmental exposure. Preliminary remediation goals are developed based upon applicable or relevant and appropriate requirements (ARARs) and other information from the investigation and risk analyses. Final remediation goals are determined when the remedy is selected; these goals establish acceptable exposure levels that are protective of human health and the environment [CERCLA 300.430 (e)(2)(I)].

3.1 Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA (1980), as amended by SARA in 1986, requires that remedial actions comply with requirements or standards set forth under federal and state environmental laws. As mandated by CERCLA § 121(d)(2)(A), remedies must consider "any promulgated standard, requirements, criteria, or limitation under a State environmental or facility siting law that is more stringent than any Federal standard, requirement, criteria, or limitation" if the former is applicable or relevant and appropriate to the property and associated remedial activities.

Potential ARARs may be classified as either applicable or relevant and appropriate. Applicable requirements are those standards promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site (U.S. EPA, 1988). Relevant and appropriate requirements are those standards promulgated under federal or state law that address problems or situations sufficiently similar to those encountered at the CERCLA site so that their use is well suited to the particular site (U.S. EPA, 1988).

ARARs are classified as being action-specific, chemical-specific, or location-specific to further clarify how to identify and comply with environmental requirements.

Action-specific ARARs set controls or restrictions on the design, performance, and other aspects of implementation of specific remedial activities. Since this FFS develops and evaluates remedial alternatives that address restricting land and groundwater use, the only action-specific ARARs that may be pertinent are the MDEQ Part 201 standards which allow for land and groundwater usage restrictions as well as Michigan's Part 201 due care provisions that prevent disturbance of or exposure to unacceptable levels of contaminants.

Location-specific ARARs must consider federal, state, and local requirements that reflect the physiographical and environmental characteristics of the property or the immediate area. Remedial actions may be restricted or precluded based on

the location or characteristics of the property and the resulting requirements. Potential location-specific ARARs are evaluated for the property in Table 3-1; no location-specific ARARs are identified.

Chemical-specific ARARs are media-specific concentration limits promulgated under federal or state law. The NCP requires, where possible, the development of health-based, property-specific levels for chemicals or media where such limits do not exist and there is a concern with their potential health or environmental impacts. Chemical-specific ARARs for the ingestion of groundwater are not included in this evaluation because U.S. EPA did not identify the need for any groundwater source-control action at the former Bronson Reel facility and area-wide groundwater will be addressed via a separate U.S. EPA action. Furthermore, a groundwater ordinance will soon be passed by the City of Bronson as a part of the NBIA OUI ROD-required interim action. The ordinance will prohibit the installation of wells and use of groundwater for drinking water purposes in the entire NBIA area until cleanup standards are met

Chemical-specific ARARs for the property include the MDEQ Part 201 Generic Cleanup Criteria and Screening Levels for Soils^{7,8}. ARARs for all potentially complete pathways were considered in the evaluation; soil leaching to groundwater for consumption was not considered. The concentrations of residual constituents in soils at the property are all below the ARARs for both residential and industrial property use. Tables 2-1 and 3-2 provide the screening of soil concentrations in relation to these ARARs for residential and industrial property use, respectively. All soil sample results from site investigations are included in these comparison tables with the exception of results obtained from soils that were removed during excavation; all concentrations are below ARARs.

Chemical-specific ARARs for groundwater beneath the property include the MDEQ Part 201 Generic Cleanup Criteria and Screening Levels for Groundwater.^{7,8} ARARs for all potentially complete pathways were considered in the evaluation; the ingestion of groundwater was not considered. The concentrations of constituents in groundwater beneath the property are all below the ARARs for both residential and industrial property use. Tables 2-2 and 3-3 provide the screening of groundwater concentrations in relation to these ARARs for residential and industrial property use, respectively. All groundwater sample results from the 2003 to 2004 SRI are included in this comparison table, including all analytes and all upgradient and downgradient groundwater samples; all concentrations are below ARARs.

In addition to ARARs, many federal and state environmental and public health programs also develop to-be-considered (TBC) criteria, guidance, and proposed standards that are not legally binding, but may provide useful information or

⁷ Criteria were promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

⁸ Michigan Department of Environmental Quality (MDEQ), Remediation and Redevelopment Division (RRD), Operational Memorandum No. 1 (December 10, 2004), and Part 201 Generic Cleanup Criteria and Screening Level Tables, as revised, June 24, 2005.

recommended procedures (U.S. EPA, 1988). These TBCs are not potential ARARs but are reviewed along with ARARs and considered when setting remediation objectives (e.g., cleanup goals). TBCs evaluated in the SRA included U.S. EPA Region IX PRGs for soils (U.S. EPA, 2002b); U.S. EPA Industrial/Commercial Migration to Groundwater Soil Screening Levels, which were calculated based on MDEQ Groundwater Contact Criteria (U.S. EPA, 2002b); and U.S. EPA Target Groundwater Concentration Corresponding to Target Indoor Air Concentration (U.S. EPA, October 2001). Evaluation of soil and groundwater concentrations in relation to these TBC criteria was performed in the SRA, as discussed in Section 2.7 above and in more detail in the SRI/SRA Report (FDA and ET, July 2005). As such, these TBC criteria will not be discussed further in this FFS.

Comparison Tables 2-1, 2-2, 3-2, and 3-3 demonstrate that all of the residual constituents found in soil and groundwater at the former Bronson Reel facility are below MDEQ Generic Cleanup Criteria (ARARs) for all appropriate pathways.

3.2 Remediation Goals

The SRA evaluated the potential risk at the property using conservative, industrial-based screening values. Evaluation in this report of potential risk in relation to promulgated MDEQ Generic Cleanup Screening Criteria (ARARs) for both industrial and residential property use demonstrates that the property could be used for unrestricted purposes with two exceptions. First, groundwater cannot be used for human consumption. Secondly, the disturbance of or exposure to soils beneath the building foundation cannot be allowed without screening because unacceptable levels of residual constituents may (or may not) be present in these soils. For these reasons, the remediation goals for the property are:

- Prevent future use of groundwater beneath the property; and
- Limit potential exposure to soils beneath the main building foundation.

3.3 General Response Actions

General response actions are actions that will lead to the accomplishment of RAOs. A general response action previously conducted at the property included the removal of over 10,000 tons of soil to remove oil-stained soils and metals above background levels. This response action was conducted by Kuhlman/New BSI with oversight by the Michigan Department of Natural Resources under Michigan Law. General response actions for the property were developed based on property-specific conditions and to satisfy the NCP (55 FR 8666). The general response actions for the surface and subsurface soil within the property boundary and groundwater beneath the property are no further action and the development of institutional controls.

4.0 DEVELOPMENT AND EVALUATION OF REMEDIAL ALTERNATIVES

Potential alternatives have been developed to address property soils and groundwater beneath the property. The NCP 40 CFR § 400.430 (e)(2)(G)(iii)(3)(i) requires that the range of alternatives includes treatment to reduce toxicity, mobility, or volume of contaminants. However, since no potential risks to human health or the environment have been identified, the range of alternatives will be limited to prevention of potential future exposure by 1) enactment of the NBIA OU1 ROD-required groundwater ordinance and existing Michigan's Part 201 due care provisions or 2) development of institutional controls.

4.1 Development of Remedial Alternatives

The potential remedial alternatives that address soils beneath the main building foundation and groundwater beneath the property and the rationale for their development follow.

Alternative 1: No Further Action with Owner/ Operator Due Care under MCLA324.20107a

Rationale:

Alternative 1 is currently protective.

Removal actions at the property included excavation of over 70 percent of exposed soils within the facility's fence line, down to the water table in most areas. Additionally, the excavations included removal of a UST, an oil-water separator, and a portion of the NBIA industrial sewer along the northern edge of the property. The post-excavation SRI conducted in 2003 and 2004 included additional extensive sampling of soils and groundwater with minimal residual constituents detected. Performance of the SRA and the additional risk screening presented in this report (Section 2.7.2) indicates that these residual constituents do not pose an unacceptable risk to human health or ecological receptors. Since no risks were identified, U.S. EPA guidance indicates that a no action remedy is appropriate (U.S. EPA, 1991).

Because the soils beneath the foundation have not been directly characterized, it is not known whether the soils contain chemical constituents above screening levels that allow for unrestricted use. The potential for exposure to soils beneath the main building foundation is limited, however, under Michigan's Part 201 due care provisions that require an owner/operator to undertake necessary measures to prevent disturbance of or exposure to hazardous substances. Therefore, prior to removing the building slab, an owner/operator would be required to characterize and manage the soils as well as manage potential exposure appropriately under Michigan statutes. The No Further Action alternative requires the accepted practice of owner/operator due care to limit disturbance of or exposure to soils beneath the building foundation.

Although the long-term ingestion of groundwater from below the Former Bronson Reel facility would lead to an unacceptable human health risk, U.S. EPA did not identify the need for any groundwater source-control action at the Bronson Reel former facility. The area-wide groundwater will be addressed via a separate U.S. EPA enforcement action and the U.S. EPA is working with PRPs to address contaminant source areas (i.e., the former LA Darling property and the former Scott Fetzer property) that were not addressed in the NBIA ROD. The NBIA ROD requires the implementation of groundwater use restrictions within the entire NBIA area as an interim protective measure until cleanup standards can be met. As such, Alternative 1 relies upon the enactment of this groundwater ordinance to control exposure.

Alternative 2: No Further Action with Institutional Controls

Rationale:

Alternative 2 includes a Restrictive Covenant to provide additional assurances to limit potential exposure in perpetuity.

As stated above, extensive removal actions have been performed at the property. The SRA and the additional risk screening presented in this report (Section 2.7.2) indicate that these residual constituents do not pose an unacceptable risk to human health or ecological receptors. Since no risks were identified, U.S. EPA guidance indicates that a no action remedy is appropriate (U.S. EPA, 1991). Under Alternative 2, an institutional control would be implemented to provide additional assurance that groundwater beneath the property would not be used, and to require characterization of soils beneath the main building foundation if the slab is removed. The institutional control would be in the form of a Restrictive Covenant as detailed in Part 201 of MDEQ regulations; a Draft Restrictive Covenant is included in Appendix A. The Restrictive Covenant would be attached to the property deed in perpetuity and would provide additional assurance that exposure to potentially affected soils or groundwater could not occur.

4.2 Detailed Analysis of Alternatives

The detailed analysis assesses the remedial action alternatives developed in Section 4.1 against the nine CERCLA evaluation criteria to form the basis for selecting a final remedial action. The intent of this analysis is to present sufficient relevant information to allow risk managers to select an appropriate remedy. Evaluation against the nine CERCLA criteria is the basis for determining the ability of a remedial action alternative to satisfy CERCLA remedy selection requirements.

The detailed analysis is conducted in two distinct phases. Initially, alternatives are individually assessed against the nine CERCLA evaluation criteria. Results of the individual analyses are then used to compare the alternatives against one another to identify advantages, disadvantages, and tradeoffs of the alternatives (Section 5). A description of the nine criteria outlined in 40 CFR 300.430(e)(9)(iii) is presented below.

Protection of Human Health and the Environment and Compliance with ARARs are the NCP Threshold Criteria.

Protection of Human Health and the Environment - Alternatives are assessed to determine whether they can adequately protect human health and the environment over both the short- and long-term. Protection of human health and the environment draws on the assessments of the other evaluation criteria including long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs.

Compliance with ARARs and Other Criteria, Advisories, and Guidance - The alternatives are assessed to determine whether they meet ARARs under federal and state environmental laws or whether they provide grounds for invoking one of the waivers in 40 CFR 300.430(f)(1)(ii)(c).

Long-Term Effectiveness and Permanence - The long-term effectiveness and permanence is the anticipated ability of the alternatives to maintain reliable protection of human health and the environment over time, once the remediation goals are met. Alternatives are assessed for the long-term effectiveness and permanence they afford, along with the degree of certainty that the alternative will prove successful.

Reduction of Toxicity, Mobility, or Volume Through Treatment and/or Containment - The degree to which the alternatives employ treatment and/or containment to reduce toxicity, mobility, or volume is assessed.

Short-Term Effectiveness - The short-term impacts of the implementation period for each of the alternatives are assessed, considering the following, as appropriate:

The Primary Balancing Criteria under the NCP include Long-Term Effectiveness and Permanence; Reduction of Toxicity, Mobility, or Volume through Treatment; Short-Term Effectiveness; Implementability; and Cost.

- Short-term risks that might be posed to the community during implementation of an alternative;
- Potential impacts to industrial or remedial workers during remedial action and the effectiveness and reliability of protective measures;
- Potential environmental impacts of the remedial action and the effectiveness and reliability of mitigative measures during implementation; and
- Time until protection is achieved.

Implementability - The ease or difficulty of implementing the alternatives is assessed by considering the following types of factors, as appropriate:

- Technical feasibility, including the reliability of the remedy, ease of undertaking additional remedial actions, and ability to monitor the effectiveness of the remedy;
- Administrative feasibility, including activities required to coordinate with other offices and agencies and the ability and time needed to obtain

any necessary approvals and permits for offsite actions from other agencies; and

- Availability of services and materials.

Cost - In accordance with CERCLA (U.S. EPA, 1988) guidance, the cost estimates are presented for comparison purposes only and have an estimated range of accuracy of -30% to +50%. A 5 percent discount rate was used to estimate present worth value, when applicable. The derivations of alternative cost estimates are provided in Appendix B.

State Acceptance - This assessment evaluates the technical and administrative issues and concerns MDEQ may have regarding each of the alternatives. This criterion will be addressed in the Proposed Plan and ROD once MDEQ comments on the FFS are received.

Community Acceptance - This assessment evaluates the issues and concerns the public may have regarding each of the alternatives. As with state acceptance, this criterion will be addressed in the ROD once public comments on the Proposed Plan are received.

The following sections present the detailed analysis of Alternatives 1 and 2.

4.2.1 Alternative 1: No Further Action with Owner/Operator Due Care under MCLA324.20107a

Protection of Human Health and the Environment – Based on the results of the SRA and the risk evaluation presented in this report, exposure to the property would not pose a risk to human health or the environment. Therefore, U.S. EPA guidance indicates that a no action remedy is appropriate (U.S. EPA, 1991).

There is no indication that exposure to soils beneath the foundation poses an unacceptable risk to human health, however, because these soils were not directly characterized, some uncertainty exists. Under Michigan's Part 201 due care provisions, an owner/operator cannot exacerbate existing conditions. Therefore, characterization of the soils beneath the main building foundation would be required if the foundation was removed. The No Further Action alternative is protective of human health if the owner/operator complies with requirements under Michigan statutes.

The City of Bronson is in the process of enacting a groundwater use ordinance that is required by the NBIA OUI ROD for the entire NBIA (Figure 1-5)⁹ as an interim protective measure until cleanup standards can be met. The interim groundwater ordinance will prohibit use of groundwater throughout the NBIA.

⁹ City of Bronson, (2004), Letter from Mr. David O'Rourke to Mr. Stephen Cunningham and Ms. Deborah Larsen, Michigan Department of Environmental Quality, October 29, 2004.

Alternative 1 is protective of human health in relation to groundwater exposure as long as the ordinance is enforced or once cleanup criteria are achieved.

Compliance with ARARs and Other Criteria, Advisories, and Guidance – As discussed in Section 3.1, constituents in soil and groundwater are all below the MDEQ Part 201 Generic Cleanup Criteria for all complete exposure pathways. Therefore, the alternative meets the chemical-specific ARARs. Additionally, no location-specific ARAR is associated with this alternative. The action-specific ARARs under Michigan's Part 201 in this alternative include following owner/operator due care provisions.

Alternative 1 requires implementation of the NBIA OU1 ROD-required groundwater ordinance and compliance with Michigan's due care provisions to provide Long-Term Effectiveness and Permanence.

Long-Term Effectiveness and Permanence – No property use controls are included in Alternative 1 other than the NBIA interim groundwater ordinance restrictions that will be enacted until cleanup criteria are achieved. Because the groundwater ordinance will prohibit use of groundwater and general due care provisions under Michigan law require characterization of soils if the main building slab is removed, this alternative is protective in the near future. Alternative 1 may not provide long-term effectiveness if the groundwater ordinance is changed by legislative process or if the building foundation is removed without following accepted environmental practices or due-care requirements under Part 201. Conducting five-year remedy reviews to inspect the condition of the building foundation, however, would provide some extension of the long-term effectiveness of this alternative. Evaluation of the status of the NBIA interim groundwater ordinance during the five-year remedy reviews would not be necessary; this ordinance will be enacted as part of the NBIA OU1 ROD requirements and future evaluation will be conducted by the NBIA OU1 PRP Group.

Reduction of Toxicity, Mobility, or Volume Through Treatment and/or Containment – A removal action has already been conducted at the property whereby over 10,000 tons of soils were removed, as well as certain underground petroleum-holding structures (i.e., a heating/cutting oil UST and an oil-water separator). This resulted in a significant reduction of toxicity, mobility, and volume of constituents. Comparison Tables 2-1, 2-2, 3-2 and 3-3 demonstrate that all of the residual chemical constituents found in soil and groundwater at the former Bronson Reel facility are below MDEQ Generic Cleanup Criteria (ARARs). In regards to the remaining residual constituents, Alternative 1 offers no additional reduction in property residual constituents through treatment or containment. However, natural attenuation mechanisms would continue to reduce the toxicity, mobility, and volume of these residual constituents.

Short-Term Effectiveness – Alternative 1 would not pose any short-term risks to the community, human health, or to the environment. The alternative is currently protective.

Implementability – Alternative 1 is readily implementable.

Cost – The capital costs associated with this alternative involve conducting five-year remedy reviews over a 30 year period. The estimated present worth cost of this alternative is \$73,800.

4.2.2 Alternative 2: No Further Action with Institutional Controls

Protection of Human Health and the Environment – Based on the results of the SRA and risk screening conducted in this report, exposure to the property does not pose a risk to human health or the environment. Alternative 2 includes the invocation of institutional controls to provide an additional layer of assurance that future use of groundwater will be restricted and characterization of soils beneath the building foundation will be required in the event the owner/operator removes the slab. Specific requirements of the Restrictive Covenant would be addressed following issuance of a ROD; a draft Restrictive Covenant is included in Appendix A.

Compliance with ARARs and Other Criteria, Advisories, and Guidance – As discussed in Section 3.1, constituents in soil and groundwater are all below the MDEQ Part 201 Generic Cleanup Criteria for all complete exposure pathways. Therefore, the alternative meets the chemical-specific ARARs. Additionally, no location-specific ARARs are associated with this alternative. The action-specific ARAR under Michigan's Part 201 of a restrictive covenant is included in this alternative.

Alternative 2 would include a Restrictive Covenant to provide additional assurance of Long-Term Effectiveness and Permanence.

Long-Term Effectiveness and Permanence – Alternative 2 would include a Restrictive Covenant to prevent disturbance of soils under the building foundations without soil characterizations and implementation of due care responsibilities by the owner/operator. Through the use of a Restrictive Covenant, which would be attached to the property deed in perpetuity, Alternative 2 offers long-term effectiveness and permanence in regard to the protection of human health. Because the Restrictive Covenant would be attached to the property deed in perpetuity, five-year reviews would not be necessary to ensure the long-term effectiveness of this alternative.

Reduction of Toxicity, Mobility, or Volume Through Treatment and/or Containment – A removal action has already been conducted at the property whereby over 10,000 tons of soils were removed, as well as certain underground petroleum-holding structures (i.e., a heating/cutting oil UST and an oil-water separator). This resulted in a significant reduction of toxicity, mobility, and volume of constituents. Comparison Tables 2-1, 2-2, 3-2 and 3-3 demonstrate that all of the residual chemical constituents found in soil and groundwater at the former Bronson Reel facility are below MDEQ Generic Cleanup Criteria (ARARs). In regard to the remaining residual constituents, Alternative 2 offers no additional reduction in property residual constituents through treatment or containment. However, natural attenuation mechanisms would continue to reduce the toxicity, mobility, and volume of these residual constituents.

Short-Term Effectiveness – Alternative 2 would not pose any short-term risks to the community, human health, or to the environment. The alternative is currently protective.

Implementability – Alternative 2 requires the invocation of a Restrictive Covenant. Because ITT does not own the property, it is recommended that the Consent Decree requiring implementation of the institutional controls be negotiated with the current property owner, Bronson Specialties Inc., because it has the authority and capability to implement the Restrictive Covenant. Therefore, the alternative should be implementable. As owner of the property for the past 25 years, Bronson Specialties Inc. is the most appropriate party to execute and implement the Consent Decree and the selected Remedial Action.

Cost – The capital costs associated with the No Further Action with Institutional Controls alternative involve obtaining a Restrictive Covenant. This alternative also eliminates the need for conducting any 5-year reviews. The estimated total cost of this alternative is \$10,000.

5.0 COMPARATIVE ANALYSIS OF ALTERNATIVES

The following is a comparative analysis of the two remedial alternatives being considered for the property. Comparisons are summarized in the table at the end of this section. Remedial alternatives were evaluated against the NCP threshold (overall protection of human health, compliance with ARARs) and primary balancing criteria (long-term effectiveness and permanence; reduction of toxicity, mobility, or volume; short-term effectiveness; implementability; and cost).

5.1 Protection of Human Health and the Environment

Both Alternative 1 and Alternative 2 are protective of human health and the environment because they both limit potential exposure to the soils beneath the building foundation and the ingestion of groundwater. U.S. EPA is pursuing enforcement actions to address NBIA site-wide groundwater contamination in the City of Bronson. The NBIA ROD established groundwater cleanup standards as federal MCLs and Michigan Groundwater/Surface Water Interface Criteria. U.S. EPA is also working with PRPs to address contaminant source areas (i.e., LA Darling property and Scott Fetzer property) not addressed in the NBIA ROD. The NBIA ROD requires the implementation of groundwater use restrictions as an interim protective measure until cleanup standards can be met. As such, Alternative 1 relies upon the enactment of the groundwater ordinance to control exposure. Alternative 1 further relies upon owner/operator due care provisions under Michigan law to characterize soils if the building foundation is removed. Alternative 2 provides an additional measure of assurance that potential exposure will not occur with implementation of a deed restriction that will limit groundwater use and require characterization of the soils if the main building slab is removed.

5.2 Compliance with ARARs and Other Criteria, Advisories, and Guidance

Constituents in soil and groundwater are below the MDEQ Part 201 Generic Cleanup Criteria for all complete exposure pathways. (Groundwater ingestion was not evaluated.) Therefore, both alternatives are compliant with the identified chemical-specific ARARs. No location-specific ARARs are associated with either alternative. Each alternative includes action-specific ARARs under Michigan's Part 201 to limit potential exposure soils beneath the main building foundation.

5.3 Long-Term Effectiveness and Permanence

Alternative 2 would include a Restrictive Covenant under MDEQ Part 201 that would provide for greater Long-Term Effectiveness and Permanence than Alternative 1.

Alternative 1 may not provide long-term effectiveness if the interim groundwater ordinance is changed by legislative process prior to the cleanup criteria being met, or if the building foundation is removed without following accepted environmental practices. Five-year reviews provide some extension of the long-term effectiveness for this alternative. Alternative 2 provides greater long-term effectiveness and permanence because it includes a Restrictive Covenant on the

property deed. The Restrictive Covenant would be attached to the property deed in perpetuity and, thus, provide additional assurance that the soils under the building foundation would be characterized if foundation demolition is considered, and that the groundwater beneath the property would not be used.

5.4 Reduction of Toxicity, Mobility, or Volume Through Treatment and/or Containment

A removal action has already been conducted at the property whereby over 10,000 tons of soils were removed, as well as a heating/cutting oil UST and an oil-water separator. The SRA and risk evaluation in this report demonstrate that residual constituents do not pose an unacceptable risk to human health or the environment. Neither Alternative 1 nor Alternative 2 offers additional reduction of the toxicity, mobility, or volume of residual soil constituents through treatment or containment. Reduction will occur, however, under each alternative through natural attenuation mechanisms.

5.5 Short-Term Effectiveness

Neither Alternative 1 nor Alternative 2 pose a short-term risk to the community, industrial workers, or the environment through their implementation.

5.6 Implementability

Alternative 1 is readily implementable but requires five-year remedy reviews. Alternative 2 is implementable following the invocation of a Restrictive Covenant.

5.7 Cost

The cost for Alternative 1 is higher than the cost for Alternative 2. The cost for Alternative 1 includes five-year remedy reviews over a 30-year period to determine the current status of the building foundation; review of the status of the interim groundwater ordinance will not be necessary because it will be evaluated and maintained by the NBIA OU1 PRP group. The cost for Alternative 2 includes negotiating and obtaining a Restrictive Covenant for the property; because the Restrictive Covenant will be attached to the property deed in perpetuity, five-year reviews will not be necessary. The costs are estimated to be \$73,800 for Alternative 1 and \$10,000 for Alternative 2. Therefore, the cost for Alternative 2 is expected to be less due to the elimination of a requirement for five-year remedy reviews.

5.8 Summary

Based on the following summary table, Alternative 1 (No Further Action with owner/operator due care under MCLA324.20107a) and Alternative 2 (No Further Action and Institutional Controls) are similar in all respects with the exception

that Alternative 2 provides more assurance of the long-term protection of human health and reduces costs by eliminating the need for any five-year reviews.

Comparative Analysis Summary

NCP Criterion	Alternative 1	Alternative 2
Protection of Human Health and the Environment	Alternative 1 is protective of human health provided the interim groundwater ordinance and owner/operator due care requirements under MI Part 201 are followed.	Alternative 2 would provide additional assurance of the protection of human health in the future through the use of a Restrictive Covenant.
	<i>Alternative 1 is not as protective as Alternative 2.</i>	<i>Alternative 2 is more protective than Alternative 1.</i>
Compliance with ARARs and Other Criteria, Advisories, and Guidance	Alternative 1 complies with ARARs.	Alternative 2 complies with ARARs.
	<i>Alternative 1 is equal to Alternative 2.</i>	<i>Alternative 2 is equal to Alternative 1.</i>
Long-Term Effectiveness and Permanence	Alternative 1 offers long-term effectiveness and permanence through an interim city ordinance and MI Part 201 due care.	Alternative 2 includes a Restrictive Covenant that would better ensure long-term effectiveness and permanence.
	<i>Alternative 1 is less effective than Alternative 2.</i>	<i>Alternative 2 is more effective than Alternative 1.</i>
Reduction of Toxicity, Mobility, or Volume Through Treatment and/or Containment	Under Alternative 1 residual constituent concentrations would be reduced through natural attenuation processes.	Under Alternative 2 residual constituent concentrations would be reduced through natural attenuation processes.
	<i>Alternative 1 is equal to Alternative 2.</i>	<i>Alternative 2 is equal to Alternative 1.</i>
Short-Term Effectiveness	Alternative 1 would pose no short-term risk to the community, industrial workers, or the environment through its implementation.	Alternative 2 would pose no short-term risk to the community, industrial workers, or the environment through its implementation.
	<i>Alternative 1 is equal to Alternative 2.</i>	<i>Alternative 2 is equal to Alternative 1.</i>
Implementability	Alternative 1 is more implementable than Alternative 2, but requires five-year reviews.	Alternative 2 is less implementable than Alternative 1 as it includes the invocation of a Restrictive Covenant.
	<i>Alternative 1 is similar to Alternative 2.</i>	<i>Alternative 2 is similar to Alternative 1.</i>

NCP Criterion	Alternative 1	Alternative 2
Cost	\$73,800 Alternative 1 includes five-year reviews.	\$10,000 5-year reviews are not necessary under Alternative 2.
	<i>Alternative 1 is more costly than Alternative 2.</i>	<i>Alternative 2 is less costly than Alternative 1.</i>

5.9 Recommendation

Alternative 2 provides greater protection of human health in the long term by implementation of a Restrictive Covenant that will be attached to the property deed in perpetuity. Alternative 2 is also less costly and less of an administrative burden due to the elimination of the need for any 5-year reviews. A ROD should be developed requiring the implementation of Alternative 2. The Consent Decree for implementation of the Remedial Action should be negotiated with the current property owner, Bronson Specialties Inc., because it has the authority and capability to implement the Restrictive Covenant.

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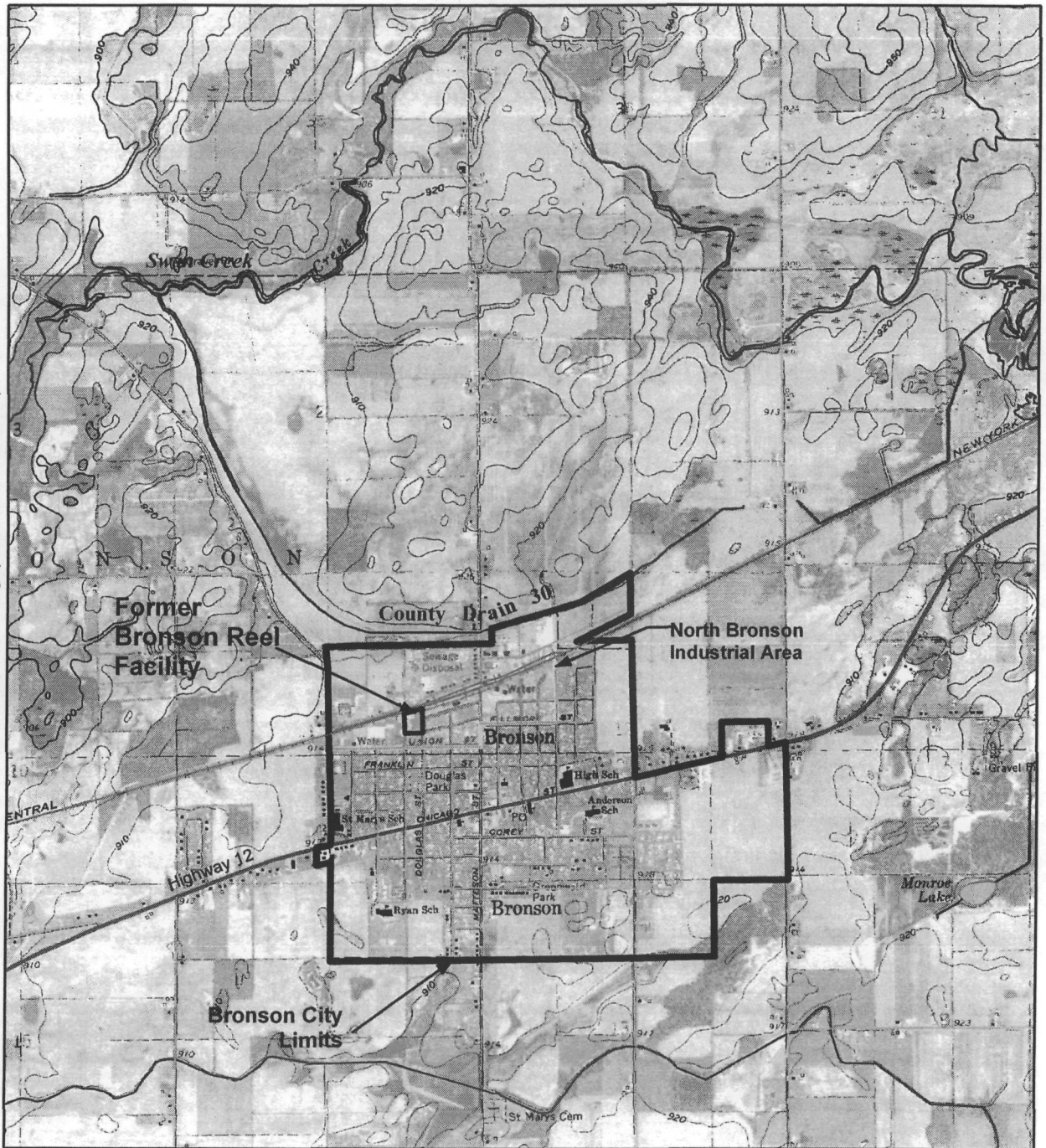
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




FIGURES

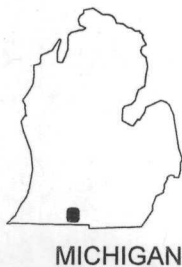


SOURCE: 1998 Digital Orthophoto Quads - MI Geographic Data Library and MI Geographic Framework Base v3b)



Legend

- | | | | | | |
|---|--------------------------------------|--|----------------|---|----------------|
|  | Former Bronson Reel Facility |  | Primary Road |  | River or Drain |
|  | North Bronson Industrial Area (NBIA) |  | Secondary Road |  | Lake |
|  | Railroad |  | Local Road | | |
|  | Bronson City Limits | | | | |

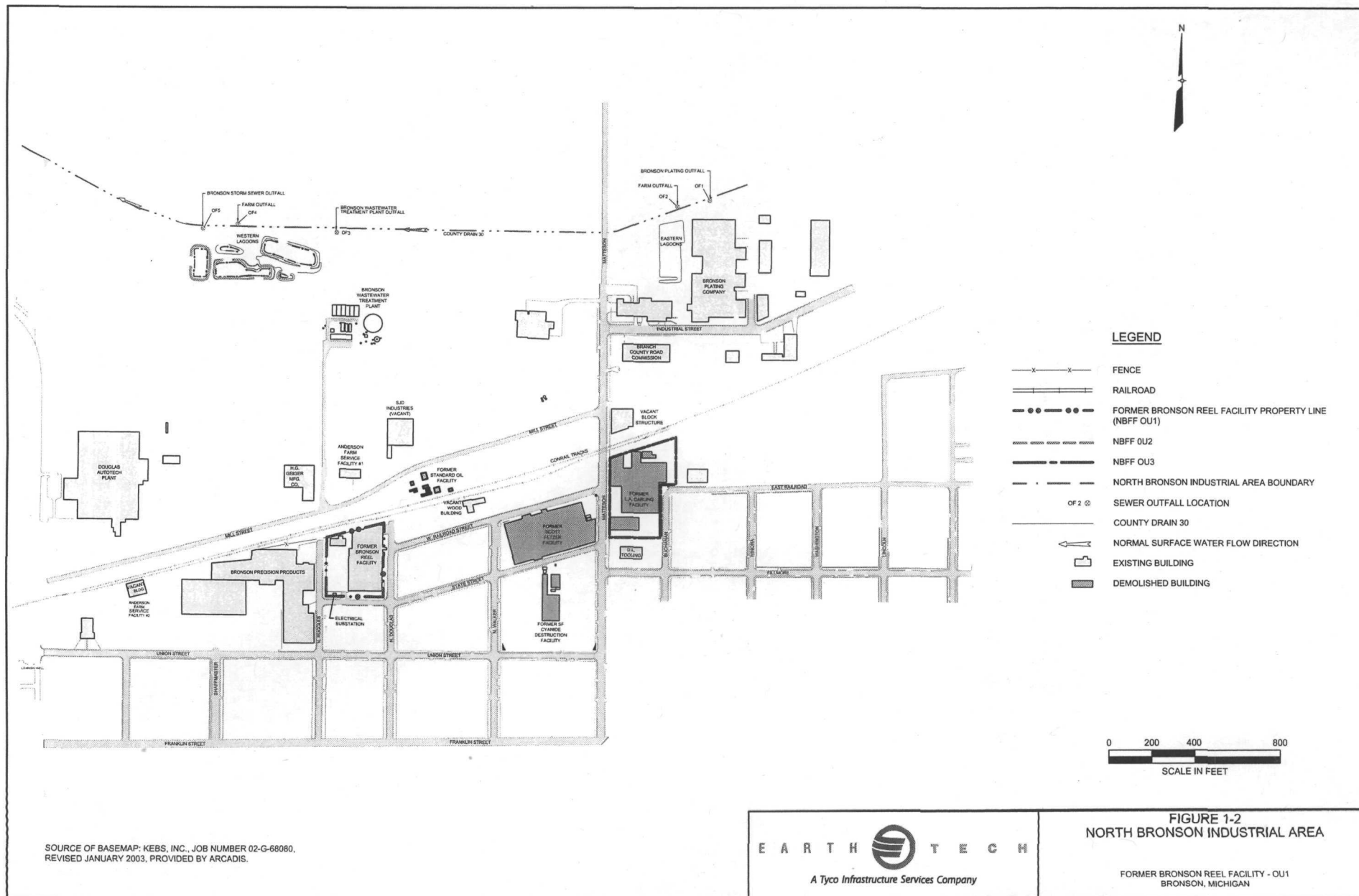


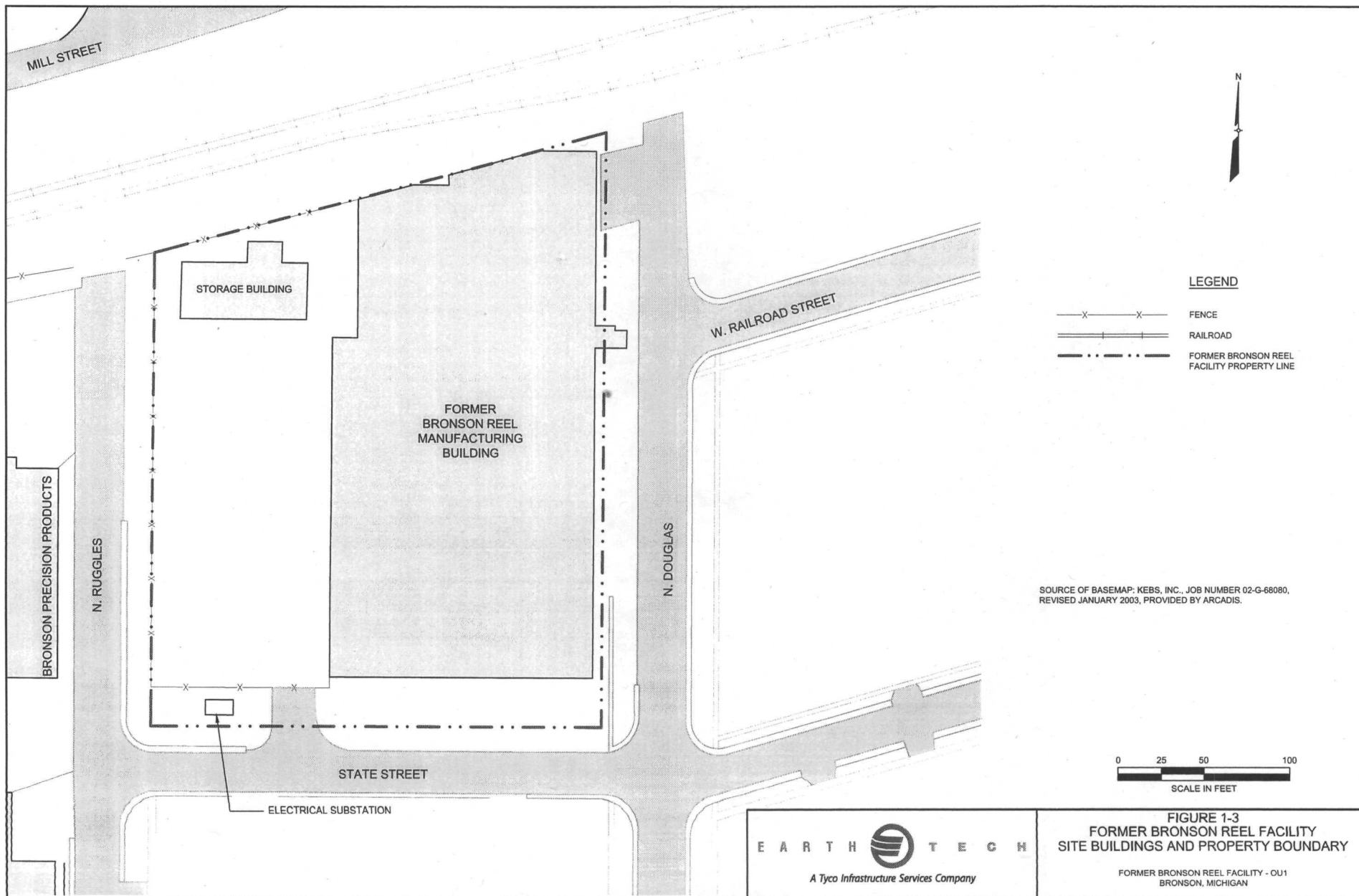
MICHIGAN

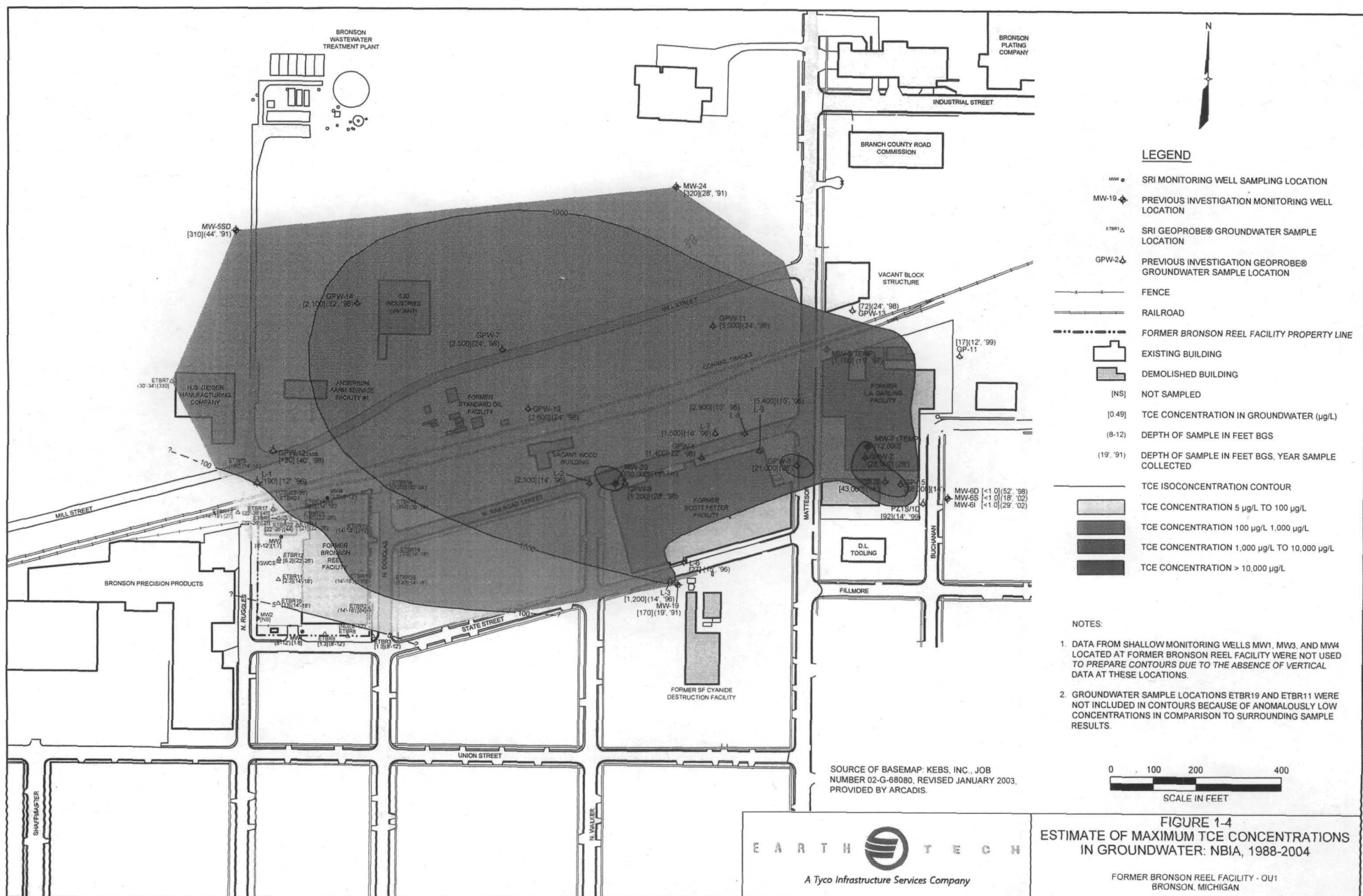


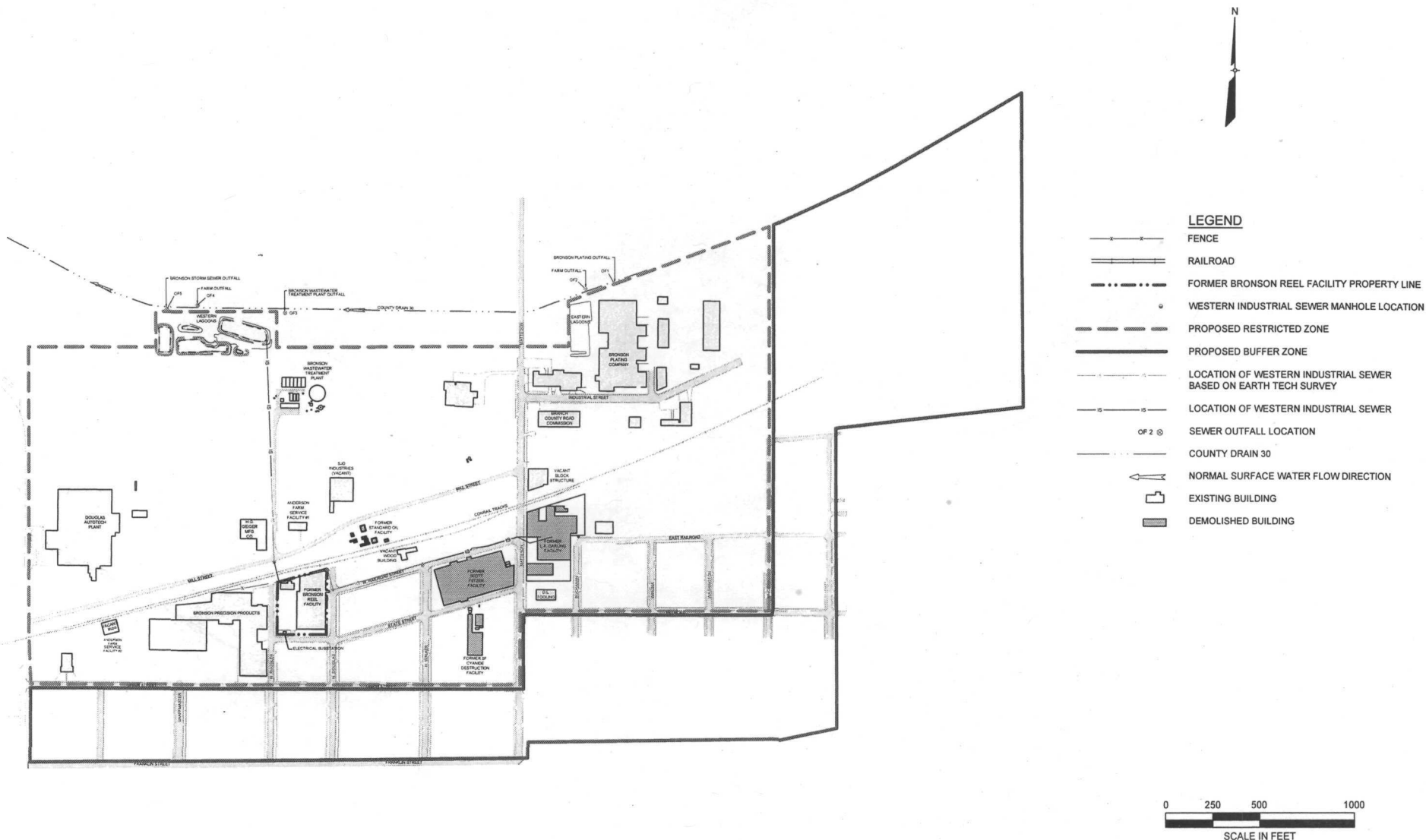
FIGURE 1-1
PROPERTY LOCATION MAP

FORMER BRONSON REEL FACILITY - OU1
BRONSON, MICHIGAN





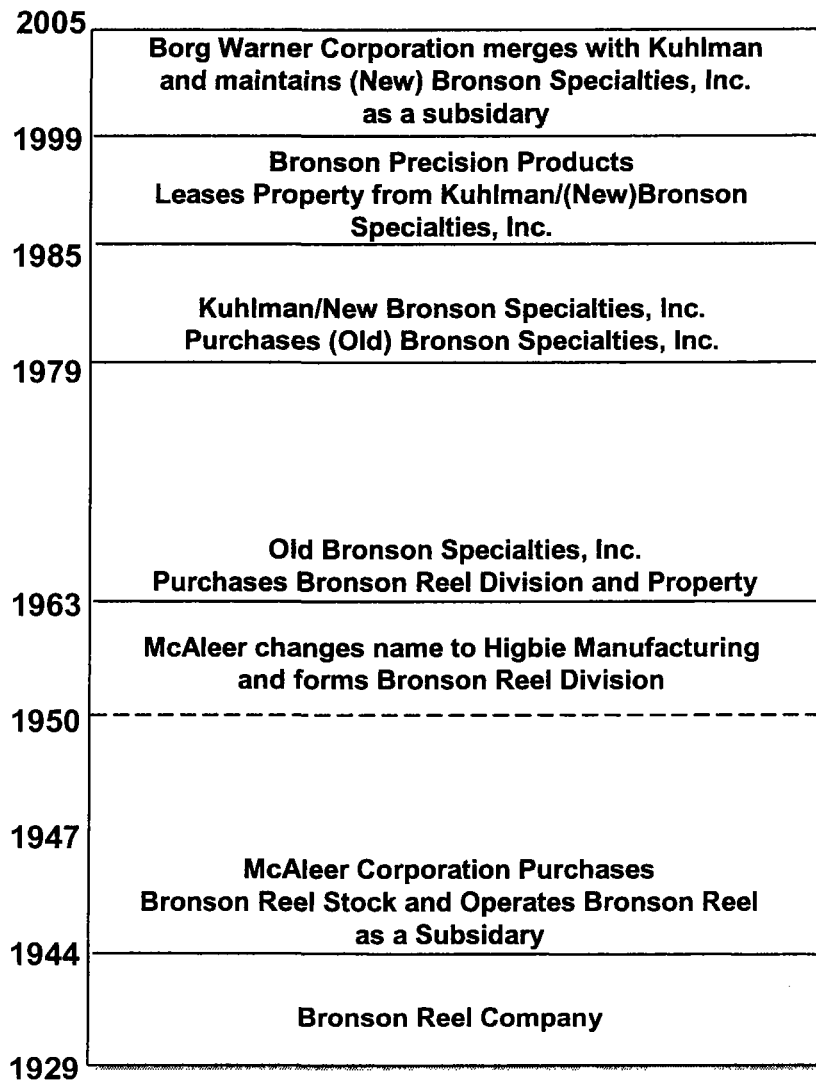




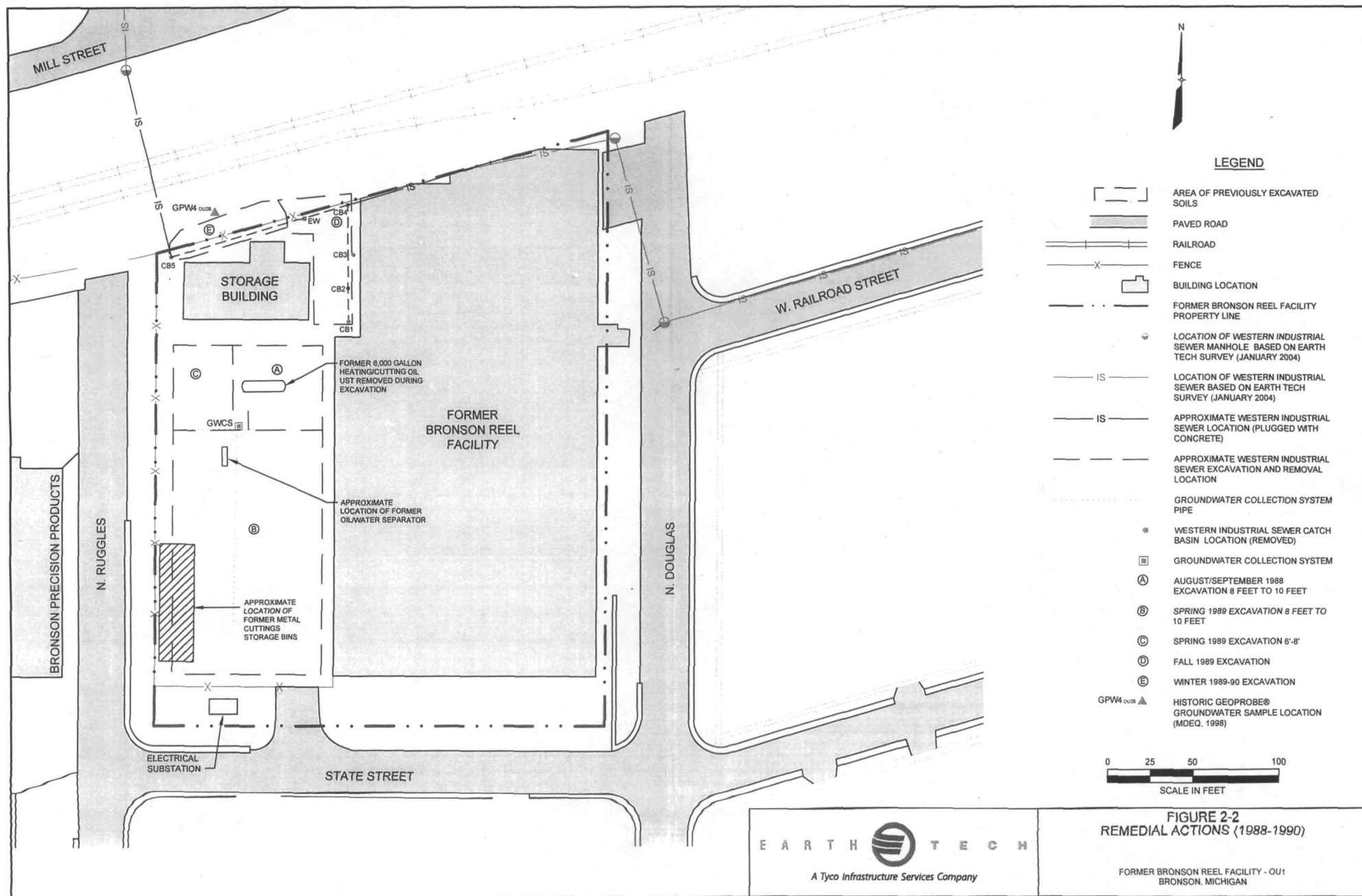
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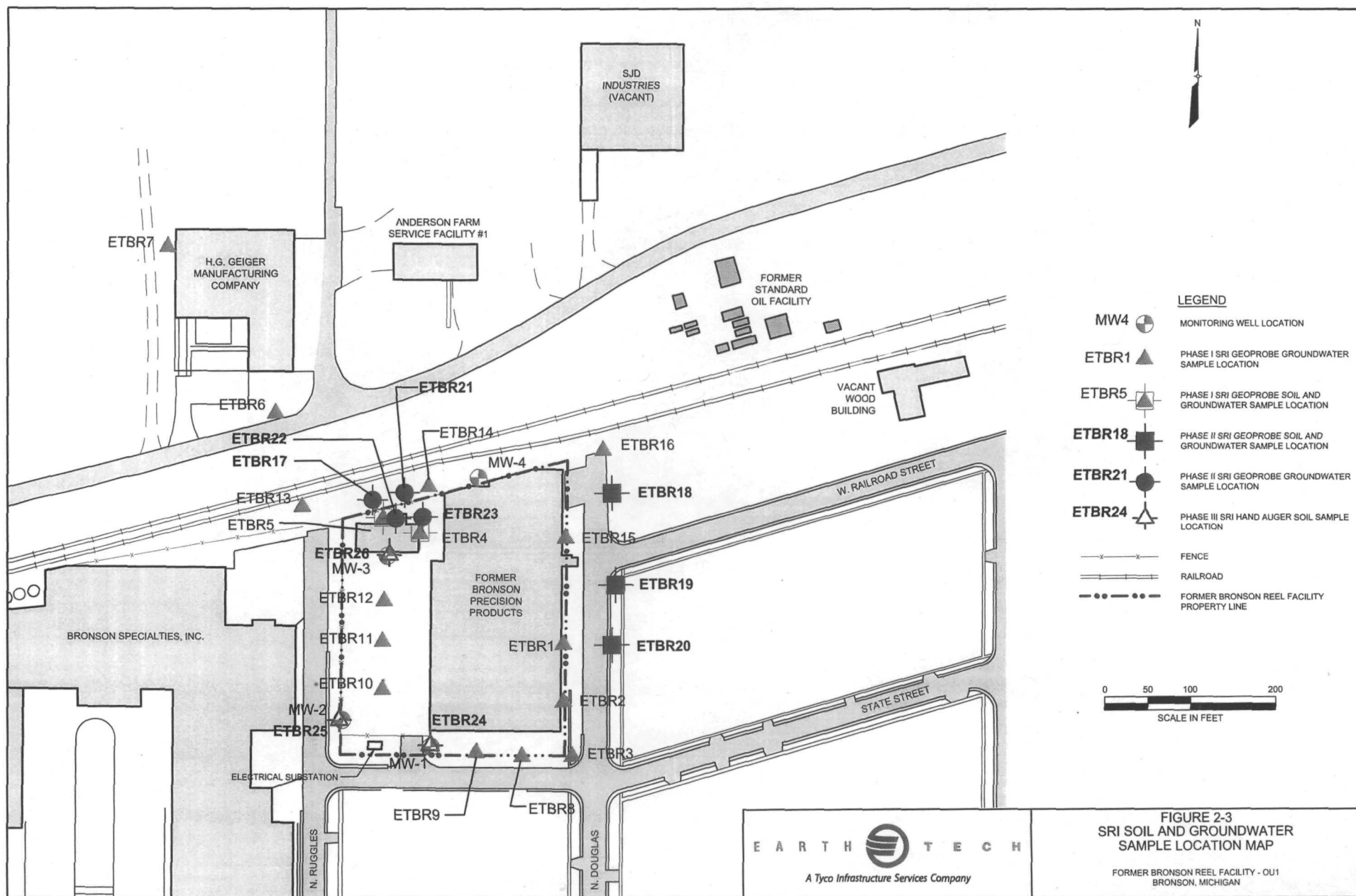
EARTH TECH
A Tyco Infrastructure Services Company

FIGURE 1-5
CITY OF BRONSON PROPOSED
GROUNDWATER ORDINANCE LOCATION MAP:
PROPOSED RESTRICTED ZONE AND PROPOSED BUFFER ZONE
FORMER BRONSON REEL FACILITY - OU1
BRONSON, MICHIGAN



1972
ITT buys stock of Higbie Manufacturing 9 years after Higbie sold the property





TABLES

Table 2-1
Detected Concentrations in Soils Compared to MDEQ Generic Screening Criteria for Residential Property Use
Former Bronson Reel Facility - NBFF OUI
Bronson, Michigan

Chemical	Maximum Concentration (mg/kg)		Location of Maximum Concentration	Depth (feet below ground surface)	Date Collected	Frequency of Detection	Soil to GW Contact ¹ (mg/kg)	Indoor Air Vol. ² (mg/kg)	Outdoor Air Vol. ³ (mg/kg)	Particulate Inhalation ⁴ (mg/kg)	Direct Contact ⁵ (mg/kg)	Exceeds Screening Levels? ⁶
Acetone	0.053	B/B/KB	ETBR23-SB-2	0-2	1/29/2004	18/29	110,000	110,000	130,000	390,000,000	23,000	No
Aluminum	6600		ETBR18-SB-6	2-10	1/30/2004	9/9	1,000,000	NLV	NLV	NCC	50,000	No
Antimony	4.4		ETBR18-SB-2	0-2	1/30/2004	5/14	49,000	NLV	NLV	13,000	180	No
Arsenic	7.5		North Wall	3'	4/24/1989	13/15	2,000	NLV	NLV	720	7.6	No
Barium	64	B/B/KB	ETBR20-SB-2	0-2	2/5/2004	10/10	1,000,000	NLV	NLV	330,000	37,000	No
Benzene	0.026		South Wall	1'	4/24/1989	2/93	220	1.6	13	380,000	180	No
Beryllium	1.0		North Wall	3'	4/24/1989	13/14	1,000,000	NLV	NLV	1,300	410	No
Bis-2-ethylhexylphthalate	1.3		South Wall	1'	4/24/1989	1/5	NLL	NLV	NLV	700,000	2,800	No
Butylbenzylphthalate	1.3		South Wall	1'	4/24/1989	1/5	310	NLV	NLV	47,000,000	310	No
Cadmium	9.2		East Wall (South End)	-	12/13/1989	22/72	230,000	NLV	NLV	1,700	550	No
Calcium	169000		ETBR19-SB-6	2-10	2/24/2004	9/9	NCC	NCC	NCC	NCC	NCC	---
Carbon Disulfide	0.0012	J	ETBR22-SB-2	0-2	1/26/2004	1/29	280	76	1,300	47,000,000	280	No
Carbon Tetrachloride	0.091		B12	0-2'	5/7/1990	1/67	92	0.19	3.5	130,000	96	No
Chloroethane	0.013		B9	2-4'	5/8/1990	1/67	950	950	30,000	670,000,000	950	No
Chloroform	0.026		B10	0-2'	5/8/1990	1/67	1,500	7.2	45	1,300,000	1,200	No
Chromium, total	280		#7, MW2	1', 6-8'	4/25/1989, 11/13/1989	78/78	1,000,000	NLV	NLV	330,000	790,000	No
Chromium, hexavalent	2.6		ETBR26-SB-2	0-2	6/29/2004	6/6	140,000	NLV	NLV	260	2,500	No
Cobalt	7.6		ETBR18-SB-6	2-10	1/30/2004	9/9	48,000	NLV	NLV	13,000	2,600	No
Copper	4400		MW4	0-2'	11/14/1989	72/72	1,000,000	NLV	NLV	130,000	20,000	No
trans-1,2-Dichloroethene	0.022		East Wall (South End)	-	12/13/1989	1/67	1,400	23	280	4,700,000	1,400	No
Di-n-butylphthalate	2.3		South Wall	1'	4/24/1989	5/5	760	NLV	NLV	3,300,000	760	No
Ethylbenzene	0.22		Northeast Corner	-	9/21/1989	7/93	140	87	720	10,000,000	140	No
Iron	15400		ETBR18-SB-6	2-10	1/30/2004	15/15	1,000,000	NLV	NLV	NCC	160,000	No
Lead	180		MW4	0-2'	11/14/1989	68/72	NCC	NLV	NLV	100,000	400	No
Magnesium	25700		ETBR18-SB-6	2-10	1/30/2004	9/9	1,000,000	NLV	NLV	6,700,000	1,000,000	No
Manganese	592	B/B/KB	ETBR20-SB-2	0-2	2/5/2004	9/9	180,000	NLV	NLV	3,300	25,000	No
Mercury	0.13		South Wall	1'	4/24/1989	10/15	47	48	52	20,000	160	No
Methylene Chloride	0.16		MW4	0-2'	11/14/1989	12/67	2,300	45	210	6,600,000	1,300	No
Molybdenum	1.9	J	ETBR18-SB-6	2-10	1/30/2004	9/9	19,000	NLV	NLV	NCC	2,600	No
Nickel	740		#10	8'	4/25/1989	71/71	1,000,000	NLV	NLV	13,000	40,000	No
Petroleum Hydrocarbons	22440		B11	6-8'	5/7/1990	46/57	NCC	NCC	NCC	NCC	NCC	---
Phosphorus	203		ETBR25-SB-2	0-2	6/29/2004	6/6	NCC	NLV	NLV	NCC	1,000,000	No
Potassium	1150		ETBR18-SB-6	2-10	1/30/2004	9/9	NCC	NCC	NCC	NCC	NCC	---
Selenium	0.41		ETBR18-SB-2	0-2	1/30/2004	3/15	78,000	NLV	NLV	130,000	2,600	No
Silver	2.2		Southeast Corner	-	9/21/1989	2/15	200,000	NLV	NLV	6,700	2,500	No
Sodium	278		ETBR18-SB-6	2-10	1/30/2004	9/9	1,000,000	NLV	NLV	NCC	1,000,000	No
Strontium	83		ETBR18-SB-6	2-10	1/30/2004	9/9	1,000,000	NLV	NLV	NCC	330,000	No
Styrene	0.00036	J	ETBR4-SB-8	2-10	9/4/2003	3/29	270	250	970	5,500,000	400	No
Sulfate	403		ETBR25-SB-6	4-6	6/29/2004	6/6	NCC	NLV	NLV	NCC	NCC	---
Tetrachloroethene	0.032		ETBR4-SB-6	2-10	9/4/2003	7/67	88	11	180	5,400,000	88	No
Thallium	2.6	J	ETBR18-SB-6	2-10	1/30/2004	8/14	15,000	NLV	NLV	NCC	35	No
Tin	5.1		ETBR18-SB-2	0-2	1/30/2004	7/9	NCC	NCC	NCC	NCC	NCC	---
Titanium	243		ETBR18-SB-2	0-2	1/30/2004	9/9	NCC	NCC	NCC	NCC	NCC	---
Toluene	0.10		B12	0-2'	5/7/1990	30/93	250	250	2,800	27,000,000	250	No

Table 2-1
Detected Concentrations in Soils Compared to MDEQ Generic Screening Criteria for Residential Property Use
Former Bronson Reel Facility - NBFF OUI
Bronson, Michigan

Chemical	Maximum Concentration (mg/kg)	Location of Maximum Concentration	Depth (feet below ground surface)	Date Collected	Frequency of Detection	Soil to GW Contact ¹ (mg/kg)	Indoor Air Vol. ² (mg/kg)	Outdoor Air Vol. ³ (mg/kg)	Particulate Inhalation ⁴ (mg/kg)	Direct Contact ⁵ (mg/kg)	Exceeds Screening Levels? ⁶
Trichloroethene	0.11	South Wall	-	12/13/1989	9/67	440	7.1	78	1,800,000	500	No
Trichlorofluoromethane	0.043	South Wall	-	12/13/1989	2/38	560	560	92,000	3,800,000,000	560	No
Vanadium	23	ETBRI8-SB-2	0-2	1/30/2004	9/9	1,000,000	NLV	NLV	NCC	750	No
m,p-Xylene	2.4	Northeast Corner	-	9/21/1989	2/2	150	150	46,000	290,000,000	150	No
o-Xylene	4.7	Northeast Corner	-	9/21/1989	1/2	150	150	46,000	290,000,000	150	No
Xylenes	0.46	B12	0-2'	5/7/1990	11/86	150	150	46,000	290,000,000	150	No
Zinc	2200	MW4	0-2'	11/14/1989	72/72	1,000,000	NLV	NLV	NCC	170,000	No

¹ Soil Leaching to Groundwater Direct Contact Criteria (MDEQ, 2005b)

² Soil Volatilization to Indoor Air Inhalation Criteria (MDEQ, 2005b)

³ Infinite Source Volatilization to Outdoor Air Inhalation Criteria (MDEQ, 2005b)

⁴ Particulate Soil Inhalation Criteria (MDEQ, 2005b)

⁵ Soil Direct Contact (Residential) Criteria (MDEQ, 2005b)

⁶ Does value exceed Screening Level?

"---" indicates that no cleanup criteria has been established.

NLV - Not likely to volatilize.

NLL - Not likely to leach.

NCC - No cleanup criteria has been established.

Chromium III value was used for total chromium; chromium VI value was used for hexavalent chromium.

Xylenes value used for m,p-Xylenes and o-Xylene

Data Qualifier Definitions.

Laboratory-added data qualifiers precede the first " ". Result and analysis qualifiers, added during data validation, follow the first and second " ", respectively.

B - The analyte was found in an associated blank as well as in the sample.

J - The result is an estimated value.

K - Common laboratory artifact detected at a concentrations greater than 10 times that detected in the associated field or laboratory blanks, or some other artifact detected at a concentration greater than 5 times that detected in the associated field or laboratory blanks.

Table 2-2
Detected Concentrations in Groundwater Compared to MDEQ Generic Screening Criteria for Residential Property Use
Former Bronson Reel Facility - NBFF OU1
Bronson, Michigan

Chemical	Maximum Concentration (µg/L)	Location of Maximum Concentration	Depth (feet below ground surface)	Date Collected	Frequency of Detection	GW Contact Criteria ¹ (µg/L)	Res & Comm I GW Vol. ² (µg/L)	Exceeds Screening Levels? ³
Acetone	4.5 J	ETBR10-GW-42	38 - 42	9/15/2003	1/149	31,000,000	1,000,000,000	No
Aluminum	697	ETBR23-GW-42	38 - 42	1/30/2004	48/152	64,000,000	NLV	No
Antimony	7.0	ETBR5-GW-18	14 - 18	9/3/2003	9/152	68,000	NLV	No
Arsenic	8.0	ETBR23-GW-49.1	45.1 - 49.1	1/31/2004	41/152	4,300	NLV	No
Barium	270	ETBR4-GW-49.7	45.7 - 49.7	9/8/2003	152/152	14,000,000	NLV	No
Benzene	0.22 J	ETBR20-GW-53.6	49.6 - 53.6	2/7/2004	1/149	11,000	5,600	No
Beryllium	4.2	ETBR23-GW-42	38 - 42	1/30/2004	27/152	290,000	NLV	No
2-Butanone (Methyl ethyl ketone)	3.2 J	ETBR10-GW-42	38 - 42	9/15/2003	2/149	240,000,000	240,000,000	No
Cadmium	30	ETBR3-GW-12	8 - 12	8/11/2003	16/152	190,000	NLV	No
Calcium	151000 B FK	ETBR4-GW-18	14 - 18	9/5/2003	152/152	NCC	NCC	---
Carbon tetrachloride	0.42 J	ETBR18-GW-18	14 - 18	1/31/2004	1/149	4,600	370	No
Chloroform	0.52 J	ETBR18-GW-34	30 - 34	2/2/2004	3/149	150,000	28,000	No
Chromium	9.3	ETBR13-GW-12	8 - 12	9/17/2003	61/152	290,000,000	NLV	No
Cobalt	3.9 J	ETBR12-GW-18	14 - 18	9/9/2003	43/152	2,400,000	NLV	No
Copper	23	ETBR4-GW-18	14 - 18	9/5/2003	44/152	7,400,000	NLV	No
1,1-Dichloroethane	5.2	ETBR18-GW-34	30 - 34	2/2/2004	11/149	2,400,000	1,000,000	No
1,1-Dichloroethene	4.6	ETBR16-GW-34	30 - 34	9/22/2003	16/149	11,000	200	No
cis-1,2-Dichloroethene	760	ETBR16-GW-34	30 - 34	9/22/2003	91/149	200,000	93,000	No
trans-1,2-Dichloroethene	13	ETBR19-GW-26	22 - 26	2/4/2004	52/149	220,000	85,000	No
Iron	8090	ETBR23-GW-12	8 - 12	1/29/2004	128/152	58,000,000	NLV	No
Lead	6.4	ETBR23-GW-42	38 - 42	1/30/2004	10/152	NCC	NLV	---
Magnesium	30900 B/FKB	ETBR4-GW-18	14 - 18	9/5/2003	152/152	1,000,000,000	NLV	No
Manganese	1320	ETBR12-GW-12	8 - 12	9/9/2003	151/152	9,100,000	NLV	No
Mercury	0.040 J	ETBR15-GW-47.9	43.9 - 47.9	8/25/2003	6/152	56	56	No
Molybdenum	4.7 J	ETBR9-GW-51-dis	47 - 51	8/5/2003	97/152	970,000	NLV	No
Nickel	24	ETBR12-GW-18	14 - 18	9/9/2003	115/152	74,000,000	NLV	No
Potassium	18600	ETBR16-GW-18	14 - 18	9/19/2003	152/152	NCC	NCC	---
Selenium	4.8 J	ETBR19-GW-18	14 - 18	2/4/2004	16/152	970,000	NLV	No
Silver	1.7	ETBR23-GW-42	38 - 42	1/30/2004	32/152	1,500,000	NLV	No
Sodium	79600	ETBR3-GW-12	8 - 12	8/11/2003	152/152	1,000,000,000	NLV	No
Strontium	252 B KB	ETBR3-GW-12	8 - 12	8/11/2003	152/152	120,000,000	NLV	No
Tetrachloroethene	2.2	ETBR22-GW-12	8 - 12	1/27/2004	8/149	12,000	25,000	No
Thallium	3.6 J	ETBR5-GW-34	30 - 34	9/4/2003	4/152	13,000	NLV	No
Tin	2.1 J	ETBR17-GW-26	22 - 26	1/22/2004	46/152	NCC	NCC	---
Titanium	28 J	ETBR3-GW-12	8 - 12	8/11/2003	83/152	NCC	NCC	---
Toluene	0.31 J	ETBR20-GW-53.6	49.6 - 53.6	2/7/2004	9/149	530,000	530,000	No
Total Cyanide	33	ETBR14-GW-49.5	45.5 - 49.5	9/17/2003	34/105	57,000	NLV	No
TPH C10-C28	2600	ETBR14-GW-12	8 - 12	9/15/2003	48/149	NCC	NCC	---
1,1,1-Trichloroethane	2.5	ETBR16-GW-34	30 - 34	9/22/2003	8/149	1,300,000	660,000	No
Trichloroethene	1200	ETBR16-GW-34	30 - 34	9/22/2003	97/149	22,000	15,000	No
Vanadium	3.0	ETBR23-GW-42	38 - 42	1/30/2004	18/152	970,000	NLV	No
Vinyl chloride	42	ETBR18-GW-34	30 - 34	2/2/2004	78/149	1,000	1,100	No
Zinc	29 B/FKB	ETBR12-GW-42	38 - 42	9/10/2003	119/152	110,000,000	NLV	No

¹ Groundwater Contact Criteria (MDEQ, 2003b)

² Residential & Commercial I Groundwater Volatilization to Indoor Air Inhalation Criteria (MDEQ, 2003b)

³ Does value exceed Screening Level?

"---" indicates that no cleanup criteria has been established.

NCC - No cleanup criteria.

NLV - Not likely to volatilize.

Trivalent chromium screening value used for chromium

(hexavalent chromium was not detected in groundwater samples for which it was analyzed).

Data Qualifiers: Laboratory-added data qualifiers precede the first "J". Result and analysis qualifiers, added during data validation, follow the first and second "F", respectively.

B - The analyte was found in an associated blank as well as in the sample.

F - Detected in the associated field (i.e., ambient) blank.

J - The result is an estimated value.

K - Common laboratory artifact detected at a concentrations greater than 10 times that detected in the associated field or laboratory blanks, or other artifact detected at a concentration greater than 5 times that detected in the blank.

Table 3-1
Potential Location-Specific ARARs
Former Bronson Reel Facility – NBFF OU1
Bronson, Michigan

Site Feature/Location	Citation	Requirement Synopsis	Consideration In This FFS
Federal			
Within 61 meters (200 feet) of a fault displaced in Holocene time	40 CFR 264.18(a)	New treatment, storage, or disposal of hazardous waste prohibited; applies to RCRA hazardous waste; treatment, storage, or disposal.	Not an ARAR since property is not within 200 feet of a fault displaced in Holocene time.
Within 100-year flood plain	40 CFR 264.18(b)	Facility must be designed, constructed, operated, and maintained to avoid washout; applies to RCRA hazardous waste; treatment, stored, or disposal.	Not an ARAR since property is not in a 100-year flood plain.
Within flood plain	Protection of floodplains (40 CFR 6, Appendix A); Fish and Wildlife Coordination Act (16 USC 661 <u>et seq.</u>); 40 CFR 6.302; Flood plains Executive Order (EO 11988)	Action to avoid adverse effects, minimize potential harm, restore and preserve natural and beneficial values; applies to action that will occur in a flood plain, i.e., lowlands, and relatively flat areas adjoining inland and coastal waters and other flood prone areas.	Not an ARAR since property is not in a flood plain.
Within area where action may cause irreparable harm, loss or destruction of significant artifacts	National Historical Preservation Act (16 USC Section 469); 36 CFR Part 65	Required that action be taken to recover and preserve artifacts when alteration of terrain threatens significant scientific, prehistorical, historical, or archaeological data.	Not an ARAR since property is not a designated archaeological area.

Table 3-1
Potential Location-Specific ARARs
Former Bronson Reel Facility – NBFF OU1
Bronson, Michigan

Site Feature/Location	Citation	Requirement Synopsis	Consideration In This FFS
Federal (Continued)			
Critical habitat upon which endangered species or threatened species depends	Endangered Species Act of 1973 (16 USC 1531 <u>et seq.</u>); 50 CFR Part 200, 50 CFR Part 402; Fish and Wildlife Coordination Act (16 USC 661 <u>et seq.</u>); 33 CFR Parts 320-330	If endangered or threatened species are present, action must be taken to conserve endangered or threatened species, including consultation with the Department of Interior.	Not an ARAR since property does not have endangered or threatened species.
Wetlands	Clean Water Action Section 404; 40 CFR Part 230, 33 CFR Parts 320-330	For wetlands as defined by U.S. Army Corps of Engineers regulations, must take action to prohibit discharge of dredged or fill material into wetlands without permit.	Not an ARAR since property is not in the proximity of a wetlands area.
Wetlands	40 CFR Part 6, Appendix A	For action involving construction of facilities or management of property in wetlands (as defined by 40 CFR Part 6, Appendix A, section 4(j)), action must be taken to avoid adverse effects, minimize potential harm, and preserve and enhance wetlands, to the extent possible.	Not an ARAR since the property is in the proximity of a wetlands area.
Wilderness area	Wilderness Act (16 USC 1131 <u>et seq.</u>); 50 CFR 35.1 <u>et seq.</u>	For Federally-owned area designated as wilderness area, the area must be administered in such manner as will leave it unimpaired as wilderness and to preserve its wilderness.	Not an ARAR since property is not in a wilderness area.

Table 3-1
Potential Location-Specific ARARs
Former Bronson Reel Facility – NBFF OU1
Bronson, Michigan

Site Feature/Location	Citation	Requirement Synopsis	Consideration In This FFS
Federal (Continued)			
Within area affecting national wild, scenic, or recreational river	Wild and Scenic Rivers Act (16 USC 1271 <u>et seq.</u>); Section 7(a)); 40 CFR 6.302(e)	For activities that affect or may affect any of the rivers specified in section 1271(a), must avoid taking or assisting in action that will have direct adverse effect on scenic river. Not an ARAR since Site is not a designated archaeological area.	Not an ARAR since property is not on or near a scenic river.
Classification and potential use of an aquifer	*Guidelines for Ground Water Classification, U.S. EPA Ground Water Protection Strategy. (U.S. EPA, 1984; U.S. EPA, 1986)	Consider Federal and State aquifer classifications in the assessment of remedial response objectives.	No longer applicable as the City of Bronson is issuing an ordinance restricting use of shallow groundwater for potable purposes.
State			
Surface Water	Michigan Natural Resources and Environmental Protection Act, 1994, Part 31 Water Resources Protection	Protection of surface water bodies of the State	Not applicable as the property does not contain or reside near a surface water body of the State.

Table 3-2
Detected Concentrations in Soil and ARAR Values for Industrial / Commercial Property Use
Former Bronson Reel Facility - NBFF OU1
Bronson, Michigan

Chemical	Maximum Concentration (mg/kg)		Location of Maximum Concentration	Depth (feet below ground surface)	Date Collected	Frequency of Detection	Soil to GW Contact ¹ (mg/kg)	Indoor Air Vol. ² (mg/kg)	Outdoor Air Vol. ³ (mg/kg)	Particulate Inhalation ⁴ (mg/kg)	Direct Contact ⁵ (mg/kg)	Exceeds ARARs? ⁶
Acetone	0.053	B B KB	ETBR23-SB-2	0-2	1 29 2004	18:29	110,000	110,000	160,000	170,000,000	73,000	No
Aluminum	6600		ETBR18-SB-6	2-10	1 30 2004	9 9	1,000,000	NLV	NLV	NCC	370,000	No
Antimony	4.4		ETBR18-SB-2	0-2	1 30 2004	5 14	49,000	NLV	NLV	5,900	670	No
Arsenic	7.5		North Wall	3'	4 24 1989	13 15	2,000	NLV	NLV	910	37	No
Barium	64	B KB	ETBR20-SB-2	0-2	2 5 2004	10 10	1,000,000	NLV	NLV	150,000	130,000	No
Benzene	0.026		South Wall	1'	4 24 1989	2:93	220	8.4	45	470,000	400	No
Beryllium	1.0		North Wall	3'	4 24 1989	13 14	1,000,000	NLV	NLV	590	1,600	No
Bis-2-ethylhexylphthalate	1.3		South Wall	1'	4 24 1989	1 5	NLL	NLV	NLV	890,000	10,000	No
Butylbenzylphthalate	1.3		South Wall	1'	4 24 1989	1 5	310	NLV	NLV	21,000,000	310	No
Cadmium	9.2		East Wall (South End)	-	12 13 1989	22:72	230,000	NLV	NLV	2,200	2,100	No
Calcium	169000		ETBR19-SB-6	2-10	2 24 2004	9 9	NCC	NCC	NCC	NCC	NCC	---
Carbon Disulfide	0.0012	J	ETBR22-SB-2	0-2	1 26 2004	1:29	280	140	1,600	21,000,000	280	No
Carbon Tetrachloride	0.091		B12	0-2'	5 7 1990	1 67	92	0.99	12	170,000	390	No
Chloroethane	0.013		B9	2-4'	5 8 1990	1 67	950	950	36,000	290,000,000	950	No
Chloroform	0.026		B10	0-2'	5 8 1990	1 67	1,500	38	150	1,600,000	1,500	No
Chromium, total	280		#7, MW2	1', 6-8'	4 25 1989, 11 13 1989	78 78	1,000,000	NLV	NLV	150,000	1,000,000	No
Chromium, hexavalent	2.6		ETBR26-SB-2	0-2	6 29 2004	6 6	140,000	NLV	NLV	240	9,200	No
Cobalt	7.6		ETBR18-SB-6	2-10	1 30 2004	9 9	48,000	NLV	NLV	5,900	9,000	No
Copper	4400		MW4	0-2'	11 14 1989	72 72	1,000,000	NLV	NLV	59,000	73,000	No
trans-1,2-Dichloroethene	0.022		East Wall (South End)	-	12 13 1989	1 67	1,400	43	330	2,100,000	1,400	No
Di-n-butylphthalate	2.3		South Wall	1'	4 24 1989	5 5	760	NLV	NLV	1,500,000	760	No
Ethylbenzene	0.22		Northeast Corner	-	9 21 1989	7:93	140	140	2,400	13,000,000	140	No
Iron	15400		ETBR18-SB-6	2-10	1 30 2004	15 15	1,000,000	NLV	NLV	NCC	580,000	No
Lead	180		MW4	0-2'	11 14 1989	68 72	NCC	NLV	NLV	44,000	900	No
Magnesium	25700		ETBR18-SB-6	2-10	1 30 2004	9 9	1,000,000	NLV	NLV	2,900,000	1,000,000	No
Manganese	592	B KB	ETBR20-SB-2	0-2	2 5 2004	9 9	180,000	NLV	NLV	1,500	90,000	No
Mercury	0.13		South Wall	1'	4 24 1989	10 15	47	89	62	8,800	580	No
Methylene Chloride	0.16		MW4	0-2'	11 14 1989	12 67	2,300	240	700	8,300,000	2,300	No
Molybdenum	1.9	J	ETBR18-SB-6	2-10	1 30 2004	9 9	19,000	NLV	NLV	NCC	9,600	No
Nickel	740		#10	8'	4 25 1989	71 71	1,000,000	NLV	NLV	16,000	150,000	No
Petroleum Hydrocarbons	22440		B11	6-8'	5 7 1990	46 57	NCC	NCC	NCC	NCC	NCC	---
Phosphorus	203		ETBR25-SB-2	0-2	6 29 2004	6 6	NCC	NLV	NLV	NCC	1,000,000	No
Potassium	1150		ETBR18-SB-6	2-10	1 30 2004	9 9	NCC	NCC	NCC	NCC	NCC	---
Selenium	0.41		ETBR18-SB-2	0-2	1 30 2004	3 15	78,000	NLV	NLV	59,000	9,600	No
Silver	2.2		Southeast Corner	-	9 21 1989	2 15	200,000	NLV	NLV	2,900	9,000	No
Sodium	278		ETBR18-SB-6	2-10	1 30 2004	9 9	1,000,000	NLV	NLV	NCC	1,000,000	No
Strontium	83		ETBR18-SB-6	2-10	1 30 2004	9 9	1,000,000	NLV	NLV	NCC	1,000,000	No
Styrene	0.00036	J	ETBR4-SB-8	2-10	9 4 2003	3:29	270	520	3,300	6,900,000	520	No
Sulfate	403		ETBR25-SB-6	4-6	6 29 2004	6 6	NCC	NLV	NLV	NCC	NCC	---
Tetrachloroethene	0.032		ETBR4-SB-6	2-10	9 4 2003	7 67	88	60	600	6,800,000	88	No
Thallium	2.6	J	ETBR18-SB-6	2-10	1 30 2004	8 14	15,000	NLV	NLV	NCC	130	No
Tin	5.1		ETBR18-SB-2	0-2	1 30 2004	7 9	NCC	NCC	NCC	NCC	NCC	---
Titanium	243		ETBR18-SB-2	0-2	1 30 2004	9 9	NCC	NCC	NCC	NCC	NCC	---
Toluene	0.10		B12	0-2'	5 7 1990	30 93	250	250	3,300	12,000,000	250	No

Table 3-2
Detected Concentrations in Soil and ARAR Values for Industrial / Commercial Property Use
Former Bronson Reel Facility - NBFF OU1
Bronson, Michigan

Chemical	Maximum Concentration (mg/kg)	Location of Maximum Concentration	Depth (feet below ground surface)	Date Collected	Frequency of Detection	Soil to GW Contact ¹ (mg/kg)	Indoor Air Vol. ² (mg/kg)	Outdoor Air Vol. ³ (mg/kg)	Particulate Inhalation ⁴ (mg/kg)	Direct Contact ⁵ (mg/kg)	Exceeds ARARs? ⁶
Trichloroethene	0.11	South Wall	-	12/13/1989	9/67	440	37	260	2,300,000	500	No
Trichlorofluoromethane	0.043	South Wall	-	12/13/1989	2/38	560	560	110,000	1,700,000,000	560	No
Vanadium	23	ETBR18-SB-2	0-2	1/30/2004	9/9	1,000,000	NLV	NLV	NCC	5,500	No
m,p-Xylene	2.4	Northeast Corner	-	9/21/1989	2/2	150	150	54,000	130,000,000	150	No
o-Xylene	4.7	Northeast Corner	-	9/21/1989	1/2	150	150	54,000	130,000,000	150	No
Xylenes	0.46	B12	0-2'	5/7/1990	11/86	150	150	54,000	130,000,000	150	No
Zinc	2200	MW4	0-2'	11/14/1989	72/72	1,000,000	NLV	NLV	NCC	630,000	No

¹ Soil Leaching to Groundwater Direct Contact Criteria (MDEQ, 2005b).

² Soil Volatilization to Indoor Air Inhalation Criteria (MDEQ, 2005b).

³ Infinite Source Volatilization to Outdoor Air Inhalation Criteria (MDEQ, 2005b).

⁴ Particulate Soil Inhalation Criteria (MDEQ, 2005b).

⁵ Soil Direct Contact (Industrial and Commercial II) Criteria (MDEQ, 2005b).

⁶ Does value exceed Applicable or Relevant and Appropriate Requirement?

"---" indicates that no cleanup criteria has been established.

NLV - Not likely to volatilize.

NLL - Not likely to leach.

NCC - No cleanup criteria has been established.

Chromium III value was used for total chromium; chromium VI value was used for hexavalent chromium.

Xylenes value used for m,p-Xylenes and o-Xylene.

Data Qualifier Definitions:

Laboratory-added data qualifiers precede the first "--". Result and analysis qualifiers, added during data validation, follow the first and second "--", respectively.

B - The analyte was found in an associated blank as well as in the sample.

J - The result is an estimated value.

K - Common laboratory artifact detected at a concentrations greater than 10 times that detected in the associated field or laboratory blanks, or some other artifact detected at a concentration greater than 5 times that detected in the associated field or laboratory blanks.

Table 3-3
Detected Concentrations in Groundwater and ARAR Values for Industrial / Commercial Use
Former Bronson Reel Facility - NBFF OU1
Bronson, Michigan

Chemical	Maximum Concentration (µg/L)		Location of Maximum Concentration	Depth (feet below ground surface)	Date Collected	Frequency of Detection	GW Contact Criteria ¹ (µg/L)	Ind & Comm II - IV GW Vol. ² (µg/L)	Exceeds ARARs? ³
Acetone	4.5	J	ETBR10-GW-42	38 - 42	9/15/2003	1/149	31,000,000	1,000,000,000	No
Aluminum	697		ETBR23-GW-42	38 - 42	1/30/2004	48/152	64,000,000	NLV	No
Antimony	7.0		ETBR5-GW-18	14 - 18	9/3/2003	9/152	68,000	NLV	No
Arsenic	8.0		ETBR23-GW-49.1	45.1 - 49.1	1/31/2004	41/152	4,300	NLV	No
Barium	270		ETBR4-GW-49.7	45.7 - 49.7	9/8/2003	152/152	14,000,000	NLV	No
Benzene	0.22	J	ETBR20-GW-53.6	49.6 - 53.6	2/7/2004	1/149	11,000	35,000	No
Beryllium	4.2		ETBR23-GW-42	38 - 42	1/30/2004	27/152	290,000	NLV	No
2-Butanone (Methyl ethyl ketone)	3.2	J	ETBR10-GW-42	38 - 42	9/15/2003	2/149	240,000,000	240,000,000	No
Cadmium	30		ETBR3-GW-12	8 - 12	8/11/2003	16/152	190,000	NLV	No
Calcium	151,000	B FK	ETBR4-GW-18	14 - 18	9/5/2003	152/152	NCC	NCC	---
Carbon tetrachloride	0.42	J	ETBR18-GW-18	14 - 18	1/31/2004	1/149	4,600	2,400	No
Chloroform	0.52	J	ETBR18-GW-34	30 - 34	2/2/2004	3/149	150,000	180,000	No
Chromium	9.3		ETBR13-GW-12	8 - 12	9/17/2003	61/152	290,000,000	NLV	No
Cobalt	3.9	J	ETBR12-GW-18	14 - 18	9/9/2003	43/152	2,400,000	NLV	No
Copper	23		ETBR4-GW-18	14 - 18	9/5/2003	44/152	7,400,000	NLV	No
1,1-Dichloroethane	5.2		ETBR18-GW-34	30 - 34	2/2/2004	11/149	2,400,000	2,300,000	No
1,1-Dichloroethene	4.6		ETBR16-GW-34	30 - 34	9/22/2003	16/149	11,000	1,300	No
cis-1,2-Dichloroethene	760		ETBR16-GW-34	30 - 34	9/22/2003	91/149	200,000	210,000	No
trans-1,2-Dichloroethene	13		ETBR19-GW-26	22 - 26	2/4/2004	52/149	220,000	200,000	No
Iron	8090		ETBR23-GW-12	8 - 12	1/29/2004	128/152	58,000,000	NLV	No
Lead	6.4		ETBR23-GW-42	38 - 42	1/30/2004	10/152	NCC	NLV	---
Magnesium	30,900	B FKB	ETBR4-GW-18	14 - 18	9/5/2003	152/152	1,000,000,000	NLV	No
Manganese	1320		ETBR12-GW-12	8 - 12	9/9/2003	151/152	9,100,000	NLV	No
Mercury	0.040	J	ETBR15-GW-47.9	43.9 - 47.9	8/25/2003	6/152	56	56	No
Molybdenum	4.7	J	ETBR9-GW-51-dis	47 - 51	8/5/2003	97/152	970,000	NLV	No
Nickel	24		ETBR12-GW-18	14 - 18	9/9/2003	115/152	74,000,000	NLV	No
Potassium	18,600		ETBR16-GW-18	14 - 18	9/19/2003	152/152	NCC	NCC	---
Selenium	4.8	J	ETBR19-GW-18	14 - 18	2/4/2004	16/152	970,000	NLV	No
Silver	1.7		ETBR23-GW-42	38 - 42	1/30/2004	32/152	1,500,000	NLV	No
Sodium	79,600		ETBR3-GW-12	8 - 12	8/11/2003	152/152	1,000,000,000	NLV	No
Strontium	252	B KB	ETBR3-GW-12	8 - 12	8/11/2003	152/152	120,000,000	NLV	No
Tetrachloroethene	2.2		ETBR22-GW-12	8 - 12	1/27/2004	8/149	12,000	170,000	No
Thallium	3.6	J	ETBR5-GW-34	30 - 34	9/4/2003	4/152	13,000	NLV	No
Tin	2.1	J	ETBR17-GW-26	22 - 26	1/22/2004	46/152	NCC	NCC	---
Titanium	28	J	ETBR3-GW-12	8 - 12	8/11/2003	83/152	NCC	NCC	---
Toluene	0.31	J	ETBR20-GW-53.6	49.6 - 53.6	2/7/2004	9/149	530,000	530,000	No
Total Cyanide	33		ETBR14-GW-49.5	45.5 - 49.5	9/17/2003	34/105	57,000	NLV	No
TPH C10-C28	2600		ETBR14-GW-12	8 - 12	9/15/2003	48/149	NCC	NCC	---
1,1,1-Trichloroethane	2.5		ETBR16-GW-34	30 - 34	9/22/2003	8/149	1,300,000	1,300,000	No
Trichloroethene	1200		ETBR16-GW-34	30 - 34	9/22/2003	97/149	22,000	97,000	No
Vanadium	3.0		ETBR23-GW-42	38 - 42	1/30/2004	18/152	970,000	NLV	No
Vinyl chloride	42		ETBR18-GW-34	30 - 34	2/2/2004	78/149	1,000	13,000	No
Zinc	29	B FKB	ETBR12-GW-42	38 - 42	9/10/2003	119/152	110,000,000	NLV	No

¹ Groundwater Contact Criteria (MDEQ, 2005b)

² Industrial & Commercial II, III & IV Groundwater Volatilization to Indoor Air Inhalation Cleanup Criteria (MDEQ, 2005b)

³ Does value exceed Applicable or Relevant and Appropriate Requirement?

"---" indicates that no cleanup criteria has been established.

NCC - No cleanup criteria

NLV - Not likely to volatilize.

Trivalent chromium screening value used for chromium

(hexavalent chromium was not detected in groundwater samples for which it was analyzed).

Data Qualifiers: Laboratory-added data qualifiers precede the first "F". Result and analysis qualifiers, added during data validation, follow the first and second "F", respectively.

B - The analyte was found in an associated blank as well as in the sample.

F - Detected in the associated field (i.e., ambient) blank.

J - The result is an estimated value.

K - Common laboratory artifact detected at a concentrations greater than 10 times that detected in the associated field or laboratory blanks, or other artifact detected at a concentration greater than 5 times that detected in the blank.

APPENDIX A
DRAFT RESTRICTIVE COVENANT

DRAFT

Revision Date: October 2005

DECLARATION OF RESTRICTIVE COVENANT

MDEQ Reference No.: RC-RRD-[YR]-[number]

This Declaration of Restrictive Covenant ("Restrictive Covenant") has been recorded with the Branch County Register of Deeds for the purpose of protecting public health, safety and welfare and the environment by prohibiting or restricting activities that could result in potential unacceptable exposure to environmental contamination present at the property located at 505 North Douglas Street, Bronson, Branch County, Michigan and legally described in Attachment A ("the "Property"). This Property is associated with the North Bronson Former Facilities Site. The United States Environmental Protection Agency (the "EPA") and the Michigan Department of Environmental Quality ("MDEQ") have selected a remedial action for the Property ("Remedial Action") as embodied in the Record of Decision, dated _____ ("ROD"), and the Consent Decree in the *United States of America v. Bronson Specialties Inc.*, filed on _____ by the U. S. District Court for the Western District of Michigan ("Consent Decree"). The Consent Decree requires Bronson Specialties Inc. and other settling parties to implement the Remedial Action. The Remedial Action is being implemented to address environmental conditions described in the Streamlined Remedial Investigation ("SRI") and Focused Feasibility Study ("FFS") completed by ITT Industries, Inc. in 2005. The MDEQ concurred with the selection of the Remedial Action set forth in the ROD, pursuant to Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended ("NREPA"), MCL 324.20101 *et seq.*, as set forth in correspondence to the EPA dated _____.

The Property impacted by this Declaration of Restrictive Covenant is more particularly described as follows:

See Attachment A for legal description of the Property.

See Attachment B for a survey of the Property and various areas subject to the use restrictions set forth herein.

Property tax ID numbers of the Property: _____

The Remedial Action and Consent Decree require the recording of this Restrictive Covenant with the Branch County Register of Deeds to: (1) restrict potential unacceptable exposures to

hazardous substances in drinking water by prohibiting use of site groundwater for drinking water and prohibiting the installation of groundwater wells on the Property, and (2) prevent potential unacceptable exposure to currently unknown concentrations, if any, of hazardous substances that may be present in soil beneath the foundation of the main building on the Property by prohibiting demolition of the building foundation or digging, excavation, or disturbing soils located beneath the main building without conducting sampling of such soils in accordance with a work plan approved by EPA and the MDEQ or otherwise receiving prior approval for such activities by the Agencies. Other than the above listed restrictions, no unacceptable risks to human health or exceedances of MDEQ residential generic cleanup criteria have been identified on the Property.

The restrictions contained in this Restrictive Covenant are based upon information available to the EPA and MDEQ at the time the Remedial Action was selected and approved by the Agencies in the Consent Decree. Any of the following may result in this Restrictive Covenant not being protective of public health, safety, and welfare, and the environment: (a) failure of the response activities to achieve and maintain the performance standards, exposure controls, and other requirements specified in the Remedial Action and Consent Decree, (b) future changes in the environmental condition of the Property or changes in the performance standards set forth in the Remedial Action and Consent Decree, (c) the discovery of environmental conditions on the Property that were not accounted for in the Remedial Action, or (d) use of the Property in a manner inconsistent with the restrictions described herein.

Property Background and Summary of Response Activities

The Property was developed by the Bronson Reel Company in 1929 for the manufacture of fishing reels. Operations included metal plating and machining of small metal parts used to make fishing reels and other precision components. In 1963, the Company (by then called Higbie Manufacturing) sold its Bronson Reel Division, including the Property, to (Old) Bronson Specialties Inc. Following the sale, the production of fishing reels declined, finally terminating in 1968. After 1968, (Old) Bronson Specialties Inc. continued to produce machine screws and other metal parts for various industries. Plating operations were discontinued in 1969, and the plating lines were sold in mid 1970. Machining of small metal parts was continued by (Old) Bronson Specialties Inc. until 1979, at which time the assets, property and business were purchased by Kuhlman Corporation/(New) Bronson Specialties Inc. Kuhlman/(New) Bronson Specialties Inc. continued the machining of small metal parts from 1979 through 1984. Thereafter, assets of (New) BSI (excluding the Property) were sold to, leased by, and business carried on by, Bronson Precision Products, Inc. from 1984 until at least the early 1990's. Kuhlman/(New) Bronson Specialties Inc. continued to own the Property during this time period and thereafter, following Kuhlman's merger with BorgWarner Corporation in 1999. BorgWarner/(New) BSI is the current owner of the Property.

On June 14, 1988, the Branch, Hillsdale, St. Joseph District Health Department inspected the Property, at which time was operated by Bronson Precision Products under lease from Kuhlman/(New) Bronson Specialties Inc. Based on the results of that Property inspection, the Health Department issued a list of required corrective actions that included proper containment of waste storage drums and metal shavings, and removal of soils contaminated with cutting oils. (Branch, Hillsdale, St. Joseph District Health Department, 1988.) Thereafter, the Property owner, Kuhlman/(New) Bronson Specialties Inc., conducted an investigation and subsequent

removal action from 1988 through 1990. Excavation of soils proceeded in several phases and resulted in the removal of 10,440 tons of soil. Seventy percent of the exposed soils within the facility's fence have been removed, down to the water table in most areas. These excavations also included removal of an underground oil storage tank, an oil-water separator, and a portion of the NBIA industrial sewer along the northern edge of the Property. Removal actions focused on soils that contained metals above background levels or that exhibited oil staining or elevated organic vapor analyzer (OVA) readings. The sampling and analysis of soils before excavation did not indicate the presence of VOCs above Michigan soil cleanup criteria. Soil borings completed before the soil removal indicated that metals concentrations decreased rapidly with depth and, thus, the various excavations effectively removed metals concentrations. In accordance with the AOC/SOW, residual metals detected in excavation wall samples and in borings installed outside the excavated areas were included in the data set evaluated in the Streamlined Risk Assessment. Soils affected by cutting oils continued down to the water table in three areas: in the northeast portion of the yard, including beneath the 8,000-gallon underground storage tank (UST) removed during the excavation (the UST originally held #2 fuel oil and, later, cutting oils); beneath the oil-water separator also removed during the excavation; and in the southwest yard area.

Geoprobe samples collected by the MDEQ in 1998 and analyzed by MDEQ's mobile laboratory indicated that deeper groundwater was affected by TCE directly north of the facility (MDEQ, May 1999). The highest TCE concentration (3,900 µg/L) was detected by MDEQ at 22 to 26 feet below the ground surface in GPW4, located directly north of the facility, approximately 20 feet downgradient of the Property and the City's industrial sewer. Thus, based on GPW4, MDEQ believed that there was some suggestion that a TCE source might exist at the former Bronson Reel Facility and that additional investigation (a Streamlined Remedial Investigation "SRI") was needed to determine if the Property is the source of this TCE. The SRI was conducted by ITT in several phases in 2003 and 2004, with a final report completed in 2005.

Summary of the SRI Results and the Nature and Extent of Constituents

As stated above, a primary purpose of the SRI was to determine whether the Property is a source of TCE in groundwater. Soil and groundwater samples also were tested for the presence of total petroleum hydrocarbons-diesel range organics (TPH-DRO), metals, and cyanide. The resulting dataset provides sufficient data to evaluate the nature and extent of these constituents. The findings of the SRI (summarized below) conclude that facility-related compounds, with the possible exception of TPH, exist at such low concentrations that no groundwater plume originates at the facility.

VOCs

Chlorinated solvents, primarily TCE and its breakdown products originating from an upgradient source east of the property, are present in groundwater beneath the Property above drinking water standards. This TCE and breakdown products do not originate from the Site. The concentration found north of the property at GPW4 could not be duplicated during the SRI. The concentration of TCE in a groundwater sample collected at the same location and depth was 45 µg/L. 1,1,1,-TCA and its breakdown products are also present in groundwater beneath the Property at concentrations that do not exceed drinking water limits. These constituents, similar

to TCE, also originate at upgradient sources (to the east). Tetrachloroethene (PCE), which may have originated at the facility, is present at some locations in shallow groundwater beneath the Property at very low concentrations from 0.4J µg/L to 2.2 µg/L, which do not exceed drinking water criteria. PCE was not detected downgradient of the Property.

Metals

Although some metals are present in remaining soils at concentrations above those found in background samples, the extent of these soils is limited. This is because all of the accessible soils within the fenced yard area have been excavated and removed. All that remains, therefore, is a narrow strip near the fence line and building where the excavation terminated. Concentrations of metals in groundwater downgradient of the facility are below federal maximum contaminant levels (MCLs) allowed for drinking water. Thus, the small amount of remaining residual metals in soils does not adversely affect groundwater quality downgradient of the Property.

TPH

Petroleum hydrocarbons are present as a thin layer of light non-aqueous phase liquid (LNAPL) at MW2 and are also present in soils and shallow groundwater at and near the facility. It is likely that these hydrocarbons results from certain historic property operations. Because the potential sources of these hydrocarbons have been removed (UST, oil-water separator, and soils), it is expected that TPH concentrations will decline over time as a result of natural attenuation processes.

Streamlined Risk Assessment Results

Based on the SRI results, a Streamlined Risk Assessment (“SRA”) was conducted, which found that no unacceptable risk is posed to the environment or human health under the current industrial land use scenario. No final human health chemicals of potential concern (COPCs) or final chemicals of potential ecological concern (COPECs) were identified. The SRA, ROD and Consent Decree conclude that no active remedial measures are required beyond this Restrictive Covenant. Although the SRA did not evaluate the potential of residential exposure because the Property has been zoned industrial and is expected to remain so, soil and groundwater concentrations have been very conservatively compared to MDEQ Part 201 residential generic criteria and screening levels. The concentrations of constituents at the Property are all below these residential criteria for all relevant pathways including: soil leaching to groundwater contact, soil volatilization to indoor and outdoor air, particulate inhalation, direct contact with soil and groundwater, and groundwater volatilization to air. The groundwater ingestion and soil leaching to groundwater ingestion pathways were not evaluated because the pathways are not complete. It is expected, however, that some concentrations in soil and groundwater beneath the Property may exceed these residential criteria.

Definitions

“MDEQ” means the Michigan Department of Environmental Quality, its successor entities, and those persons or entities acting on its behalf.

“U. S. EPA” means the United States Environmental Protection Agency, its successor entities, and those persons or entities acting on its behalf.

“Owner” means at any given time the then-current titleholder of the Property or any portion thereof.

All other terms used in this document which are defined in Part 3, Definitions, of the NREPA; Part 201 of the NREPA; or the Part 201 Administrative Rules (“Part 201 Rules”), 1990 AACSR 299.5101, *et seq.*, shall have the same meaning in this document as in Parts 3 and 201 of the NREPA and the Part 201 Rules, as of the date of filing of this Restrictive Covenant.

NOW, THEREFORE,

Declaration of Land Use or Resource Use Covenants and Restrictions

Pursuant to the Remedial Action and the Consent Decree, the Owner hereby declares and covenants that the Property is and shall be subject to the following covenants and restrictions:

1. The Owner shall not undertake and shall prohibit activities on the Property that may result in unacceptable exposures as established in the Consent Decree. These prohibited activities include:

(a) any excavation or other intrusive activity in soils below the slab or foundation of the main building on the Property without conducting sampling of such soils in accordance with a work plan approved by the Agencies, or otherwise accepted by the Agencies.

(b) any construction of water wells or other devices to extract groundwater for consumption, irrigation, or any other use, except for wells and devices that are part of an Agency-approved response activity or investigation. Short-term dewatering for construction purposes is permitted provided the dewatering, including management and disposal of the groundwater, is conducted in accordance with all applicable local, state, and federal laws and regulations and does not cause or result in a new release, exacerbation of existing contamination, or any other violation of local, state, and federal environmental laws and regulations including, but not limited to, Part 201 of the NREPA.

3. The Owner shall not undertake and shall prohibit any demolition or removal of the main building concrete slab or foundation without conducting sampling of soils beneath the building in accordance with a work plan approved by the Agencies or otherwise receiving prior approval for such activities by the Agencies.

4. Access. The Owner grants to the EPA, the MDEQ, and each Settling Defendant in the Consent Decree, and their respective representatives, contractors, and assignees, the unrestricted right to enter the Property for the purpose of implementing, performing, constructing and monitoring the Remedial Action, including the right to take samples, inspect the operation of the response activities, inspect any records relating thereto, and to perform any actions necessary to maintain compliance with Part 201 and the Remedial Action. The access rights granted herein shall be non-terminable and shall remain in full force and effect so long as any obligation or

liability of the MDEQ, the EPA, or any Settling Defendant continues under or in respect of the Consent Decree or the Remedial Action. The access rights granted under this Section 5 shall constitute an easement in gross, which easement rights shall be fully assignable in conjunction with the assignment of an assignor's obligations in respect of the Remedial Action.

5. Notice. The Owner shall provide notice to the EPA, MDEQ, and each Settling Defendant in the Consent Decree, and their respective assignees, of the Owner's intent to convey or grant any interest in the Property at least fourteen (14) business days prior to consummating the conveyance or grant. Any conveyance or grant of title, easement, or other interest in the Property shall not be consummated by the Owner without (a) an express reference in the conveyancing or granting instrument to this Restrictive Covenant and its recording information and a statement in the conveyancing or granting instrument that the conveyance or grant is made and accepted subject to all of the terms of this Restrictive Covenant and that the grantee shall be bound by all of the terms and conditions of this Restrictive Covenant, which conveyancing or granting instrument shall be signed and acknowledged by each grantee, and (b) adequate and complete provision for compliance with the terms and conditions of this Restrictive Covenant, the Consent Decree, the statement of work attached to the Consent Decree and the applicable provisions of Section 20116 of the NREPA. The notice required to be made under this Paragraph shall be made to:

EPA: _____

MDEQ: Director, MDEQ
P. O. Box 30473
Lansing, Michigan 48909-7973

Settling Defendants: _____

All notices required to be made under this Paragraph shall include a statement that the notice is being made pursuant to the requirements of this Restrictive Covenant, MDEQ Reference Number RC-RRD-[YR]-[number]. A copy of this Restrictive Covenant and the Consent Decree shall be provided to all future owners, heirs, successors, lessees, easement holders, assigns, and transferees by the person transferring the interest prior to the transfer.

6. Term and Enforcement of Restrictive Covenant. This Restrictive Covenant and all of its terms shall run with and bind the Property and shall be binding on the Owner, all future owners of all or any part of or any interest in the Property, all occupants and users of the Property, all current and future successors, lessees, easement holders, and their respective assigns, authorized agents, employees, and persons acting under their direction and control. The provisions of this Restrictive Covenant are expressly acknowledged to touch and concern the Property and are not intended and shall not be construed as mere personal agreements or obligations. This Restrictive Covenant may only be modified or rescinded with the express written approval of the MDEQ, the EPA and the Settling Defendants in the Consent Decree, or

their respective representatives and assignees. Neither the Owner nor the MDEQ has any right whatsoever to waive compliance with all or any of the restrictions in this Restrictive Covenant without the express written consent of the EPA and all of the Settling Defendants.

The State of Michigan, through the MDEQ, the United States of America, through the EPA, and each Settling Defendant, or their respective representatives or assignees, shall each be entitled and have standing (and are expressly authorized and given standing) to enforce the restrictions set forth in this Restrictive Covenant by an action at law or in equity in a court of competent jurisdiction. Injunctive relief is expressly declared to be an available enforcement mechanism for this Restrictive Covenant. If a court of competent jurisdiction finds that the EPA or any of the Settling Defendants in the Consent Decree, or their representatives or assignees, has no right to enforce the restrictions set forth in this Restrictive Covenant or refuses to recognize the EPA or any of the Settling Defendants in the Consent Decree as having the right or standing to enforce this Restrictive Covenant, the State of Michigan shall enforce the restrictions on behalf of the EPA and the Settling Defendants and their representatives or assignees. The enforcement rights of the State of Michigan, the EPA and the Settling Defendants shall be assignable to the extent that their obligations in respect of the Remedial Action have been assigned.

No waiver or variance or failure to enforce this Restrictive Covenant shall (except only to the extent of any specific, express waiver or variance given in writing by the MDEQ with the written approval of the EPA and the Settling Defendants) excuse or otherwise affect any duty or obligation hereunder nor waive any noncompliance nor limit the strict enforceability of this Restrictive Covenant in accordance with its terms.

7. Severability. If any provision of this Restrictive Covenant is held to be invalid, illegal, or unenforceable by any court of competent jurisdiction or otherwise, the invalidity, illegality, or unenforceability of such provision shall not affect the validity, legality or enforceability of any other provisions hereof, and all such other provisions shall continue unimpaired and in full force and effect.

8. Authority to Execute Restrictive Covenant. The undersigned person executing this Restrictive Covenant represents and certifies that he or she is duly authorized and has been empowered to execute and deliver this Restrictive Covenant on behalf of the Owner.

9. Disclaimer. It is expressly intended that this Restrictive Covenant is not, and shall not be interpreted or construed as, a reciprocal negative easement or an equitable servitude against or affecting any land adjacent to or nearby the Property in which either the MDEQ, the EPA or any Settling Defendant in the Consent Decree has or claims an interest. The restrictions in this Restrictive Covenant are intended to affect only the Property.

10. Marketable Record Title Act. The MDEQ, the EPA, and each Settling Defendant in the Consent Decree shall each have the unrestricted right to re-record this Restrictive Covenant, and/or to prepare and record against the title to the Property the affidavit contemplated by the Michigan Marketable Record Title Act to preserve and continue the effectiveness of this Restrictive Covenant beyond the applicable period provided in the Marketable Record Title Act. To the extent permitted by law, the Owner declares its intent that this Restrictive Covenant

continue in effect for the period contemplated by Paragraph 7 irrespective of the application of the Michigan Marketable Record Title Act.

IN WITNESS WHEREOF, Owner has caused this Restrictive Covenant to be executed on this _____ day of _____, 2005.

Owner

Bronson Specialties Inc.

By: _____
Signature

Name: _____
Print or Type Name

Its: _____
Title

STATE OF MICHIGAN)
) ss.
COUNTY OF _____)

The foregoing instrument was acknowledged before me _____, 2005 by _____ who is the _____ of Bronson Specialties Inc., on behalf of the corporation.

Notary Public _____ County, Michigan
My Commission Expires: _____
Acting in the County of: _____

Consent on following page.

Consent of the State of Michigan

The State of Michigan hereby agrees and consents to the recording of this Restrictive Covenant and subjects any interest it may have in the Property to this Restrictive Covenant.

The State of Michigan

By: _____
Signature

Name: _____
Print or Type Name

Its: _____
Title

STATE OF MICHIGAN)
)ss
COUNTY OF _____)

The foregoing instrument was acknowledged before me _____, 2005 by _____ who is the _____ of the State of Michigan, on behalf of the State.

Notary Public _____ County, Michigan
My Commission Expires: _____
Acting in the County of: _____

EXHIBIT 1
LEGAL DESCRIPTION OF PROPERTY

EXHIBIT 2
SURVEY OF THE PROPERTY

APPENDIX B
DETAILED COST ESTIMATES

TABLE B-1
COST ESTIMATE SUMMARY
ALTERNATIVE 1: NO FURTHER ACTION
FORMER BRONSON REEL FACILITY - NBFF OU1
BRONSON, MICHIGAN

Total First Year Capital Cost	Unit	Unit Cost	Cost
Total First Year Estimated Cost			\$0.00
Present Value Cost	Unit	Unit Cost	Cost
Includes:			
Present Value Discount Rate	5%		
Total First Year Cost	1	\$0.00	\$0.00
Task 01: 5-Year Remedy Review	1	\$20,000.00	\$73,800.00
Total Present Value Cost			\$73,800.00

Assumptions:

Task 01: Includes the following:

5-Year Remedy Review and Reporting - Years 5, 10, 15, 20, 25, and 30

TABLE B-2
COST ESTIMATE SUMMARY
ALTERNATIVE 2: NO FURTHER ACTION WITH INSTITUTIONAL CONTROLS
FORMER BRONSON REEL FACILITY - NBFF OU1
BRONSON, MICHIGAN

Total First Year Capital Cost	Unit	Unit Cost	Cost
Task 01: Negotiating and Obtaining Restrictive Covenants	1	\$10,000.00	\$10,000.00
Total First Year Estimated Cost			\$10,000.00
Present Value Cost	Unit	Unit Cost	Cost
Includes:			
Total First Year Cost	1	\$10,000.00	\$10,000.00
Total Present Value Cost			\$10,000.00

Assumptions:

Task 01: Includes attorney fees to negotiate and obtain Restrictive Covenants